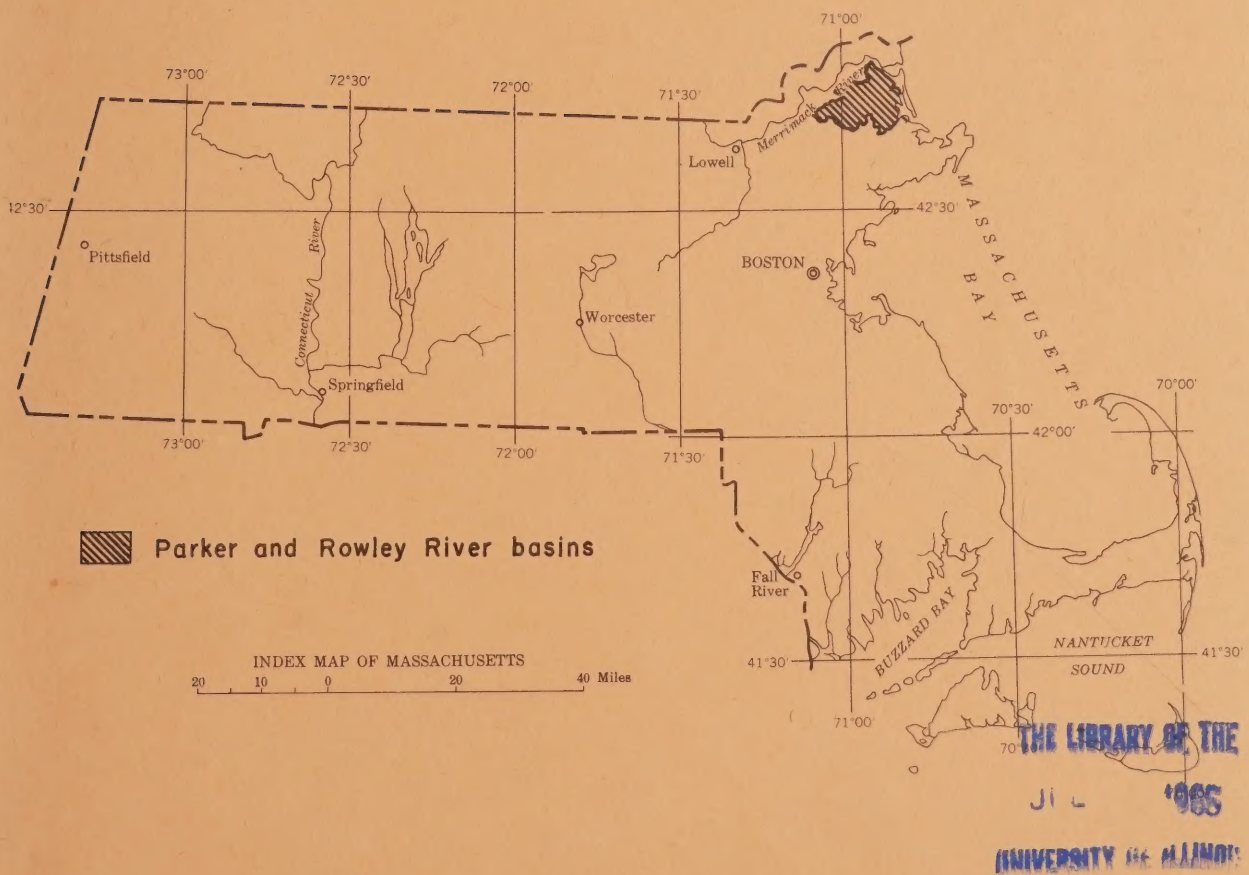
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MASSACHUSETTS BASIC-DATA REPORT NO. 4
GROUND-WATER SERIES

PARKER AND ROWLEY RIVER BASINS

By

EDWARD A. SAMMEL



PREPARED IN COOPERATION WITH
THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
1962

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Records of wells, materials tests, and chemical analyses of water in the Parker and Rowley River basins, Massachusetts

by

Edward A. Sammel

Prepared in cooperation with

THE COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF PUBLIC WORKS

Boston, Massachusetts

1962

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INTRODUCTION

The Parker and Rowley Rivers drain an area of about 77 square miles in northeastern Massachusetts (fig. 1). Included in the area are portions of the towns of Boxford, Georgetown, Groveland, Ipswich, Newbury, Newburyport, North Andover, Rowley, and West Newbury.

This report presents basic data collected as part of an investigation of the geology and ground-water resources of the Parker and Rowley River basins by the U. S. Geological Survey in cooperation with the Massachusetts Department of Public Works. The data have been prepared for release in order to make available to the public basic ground-water data that will be useful in the planning of water-resources development.

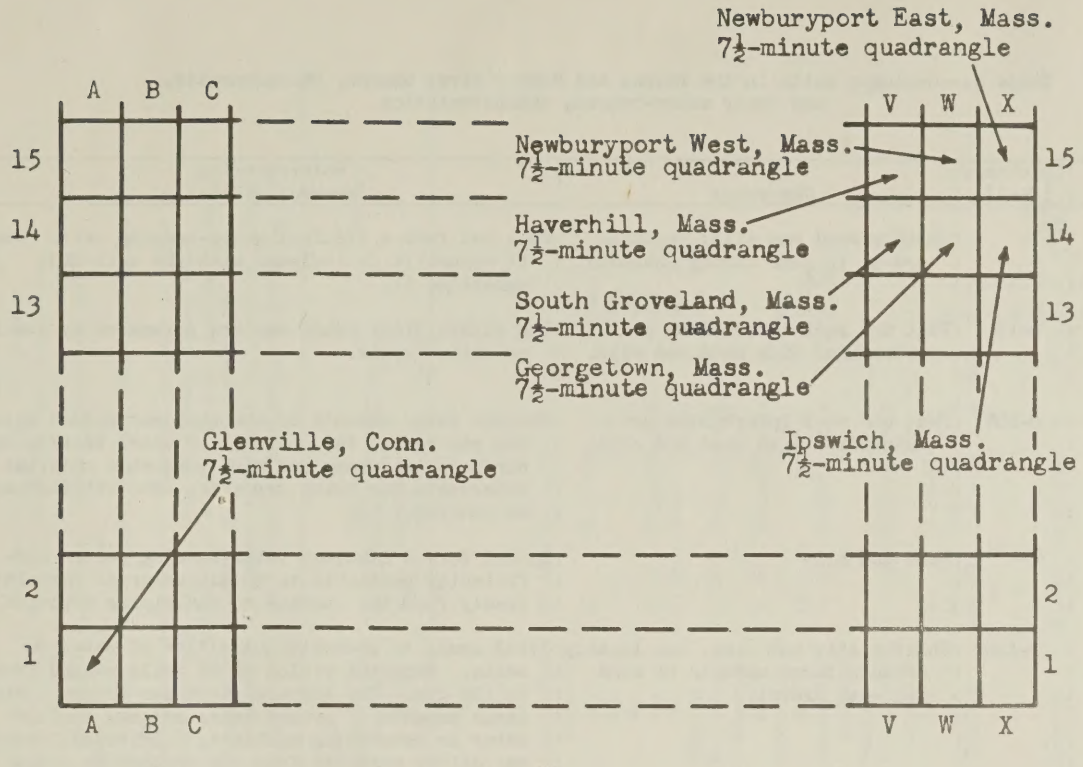
Most of the data in this report were collected by Gordon S. Bird, Henry G. Healy, Samuel J. Pollock, and Edward A. Sammel during the period 1958-61. The data include records of 377 wells or groups of wells and test holes (table 2); logs of 204 wells and test holes (table 3); chemical analyses of 19 water samples (table 4); measurements of water levels in 15 wells (table 6); and pumpage of ground water for public supply in 4 municipalities (table 7). The locations of wells and test holes are shown on figure 1.

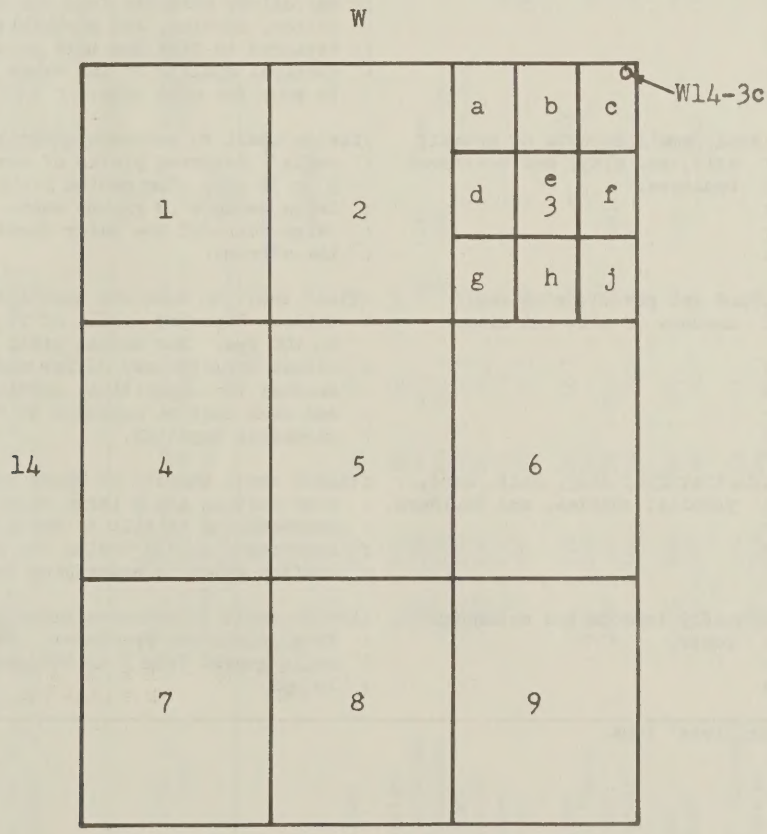
Table 1 is intended as an aid in determining the general characteristics and relative excellence as aquifers of the water-bearing units penetrated by the wells and test wells listed in table 2. Tables 8, 9, and 10 present laboratory data relating to the hydrologic and engineering properties of the unconsolidated deposits encountered in the Parker and Rowley River basins.

WELL-NUMBERING AND LOCATION SYSTEMS

In Massachusetts each well is designated by a symbol whose first term is the name of the town or city in which the well is located and whose second term is a number that is assigned in the order in which the well was inventoried within the town or city. A separate series of numbers beginning with 1 is used within each town or city. In tables the name of the town and the number are given, but on the map (fig. 1) only the number appears beside the symbol of the well.

For ease in locating wells and test holes on the map a location system based on the $7\frac{1}{2}$-minute topographic quadrangles in New England is used. In this system each $7\frac{1}{2}$-minute quadrangle is designated by a capital letter and a number beginning with A1 for the Glenville quadrangle, Connecticut. From here the quadrangles are lettered from west to east and numbered from south to north. Each $7\frac{1}{2}$-minute quadrangle is subdivided into nine $2\frac{1}{2}$-minute rectangles, and each $2\frac{1}{2}$-minute rectangle is subdivided into nine 50-second rectangles, as shown on the sketch (fig. 2). The location designation for each well and test hole is listed in table 2. On the well-location map (fig. 1), the quadrangle designators are indicated on the margins and the $2\frac{1}{2}$-minute rectangles are bounded by the lines of latitude and longitude, but the 50-second rectangles are not shown.





Georgetown, Mass. 7½-minute quadrangle

Figure 2.--Sketch illustrating well-location system.

Table 1.--Geologic units in the Parker and Rowley River basins, Massachusetts, and their water-bearing characteristics

Geologic unit	Thickness (feet)	Character	Water-bearing characteristics
Alluvium	-	Chiefly sand and silt; contains gravel in some stream channels.	Does not form a distinct water-bearing unit. Where it occurs it is included with the unit that underlies it.
Salt-water marsh deposits	0-13	Peat and muck interbedded or intermixed with sand and silt.	Lie within tidal range and are permeated by brackish or saline water.
Swamp deposits	0-18*	Peat and muck interbedded or intermixed with sand and silt.	Contain large amounts of absorbed and ponded water, but may retard the movement of water between the surfaces of swamps and more permeable material underneath the swamp deposits. Not utilized as an aquifer.
Wind deposits	0-4	Sand and silt	Do not form a distinct water-bearing unit. Sufficiently permeable to permit water to percolate freely from the surface to underlying deposits.
Marine deposits	0-110*	Chiefly silt and clay, but locally contain large amounts of sand and some gravel.	Yield small to moderate quantities of water to wells. Reported yields of 48 wells ranged from 0 to 100 gpm. The average yield was 42 gpm. Store large amounts of ground water and may confine water in underlying aquifers. Individual deposits may differ markedly from one another in composition, sorting, and permeability, and each must be explored to find the more permeable deposits. The chemical quality of the water from many deposits is poor for most uses.
Outwash	0-55*	Sand, small amounts of gravel, silt, and clay, and scattered boulders.	Yields small to moderate quantities of water to wells. Reported yields of seven wells ranged from 3 to 75 gpm. The median yield was 28 gpm. Stores large amounts of ground water and furnishes a large share of the water forming the base flow of the streams.
Ice-contact deposits	0-102*	Sand and gravel, with small amounts of silt and clay.	Yield small to moderate quantities of water to wells. Reported yields of 14 wells ranged from $1\frac{1}{2}$ to 100 gpm. The median yield was 21 gpm. Individual deposits may differ markedly from one another in composition, sorting, and permeability, and each must be explored to find the more permeable deposits.
Till	0-123*	Unstratified clay, silt, sand, pebbles, cobbles, and boulders.	Yields small amounts of water to wells. Because of poor sorting and a large range of particle size, permeability of till is small. Many shallow wells reportedly go dry during the summer. Till may confine water in underlying bedrock.
Bedrock	-	Chiefly igneous and metamorphic rocks.	Yields small to moderate amounts of water to wells from joints and fractures. Reported yields of 27 wells ranged from $\frac{1}{2}$ to 100 gpm. Median yield was 10 gpm.

*Maximum values from drillers' logs.

Table 2.--Records of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts

Well no.: For explanation of well-numbering system, see text.
Location: For explanation of well-location system, see text.
Altitude of land-surface datum: Altitudes expressed in feet and tenths, or in feet, tenths, and hundredths are instrumentally determined; those in whole feet are interpolated from topographic maps. Datum is mean sea level.
Type of well: A, augered; Dg, dug; Dn, driven; Dr, drilled; GP, gravel-packed; T, materials-test hole.
Depth of well: Depths expressed in feet and tenths are measured; those in whole feet are reported.
Depth to bedrock or refusal: An "R" appended to the depth indicates the well or test hole was bottomed at refusal which may be bedrock, a boulder, a hard or cemented layer, or till.
Level: Water levels expressed in feet and tenths, or in feet, tenths, and hundredths are measured; those expressed in whole feet are reported. Depths are below land-surface datum, except when preceded by a + indicating they are above land-surface datum.
Use: C, commercial or industrial; D, domestic; F, fire storage; Ir, irrigation; N, unused; O, U. S. Geol. Survey observation well; PS, public supply; S, stock; T, test.
Type of pump: B, bucket; C, centrifugal; H, hand pump; J, jet; Pn, piston; T, turbine.
Remarks: A, abandoned and destroyed; C, chemical analysis in table 4; D, well reportedly has gone dry; F, well reportedly flowed when drilled:-rate of flow in gallons per minute; L, log in table 3; ND, well reportedly has never gone dry; PD, well reportedly has been pumped dry; T, temperature in degrees Fahrenheit; Y, yield in gallons per minute; dd, drawdown in feet produced by pumping at preceding rate.

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								ESSEX COUNTY							
								BOXFORD							
87	V14-5b	A. Allen	-	145	Dg	23.5	30	-	-	Ice-contact deposits	20.48	8-14-57	D	-	
89	V14-5c	P. Vrettos	-	150	Dg	28	36	-	-	do.	26	8-14-57	D	-	ND.
90	V14-5c	R. Cunningham	1930	150	Dn	105	2½	105	Sand	do.	-	-	D	-	ND.
91	V14-5c	C. Cunningham	1954	150	Dn	120	2½	120	do.	do.	-	-	D	-	ND.
92	V14-5c	A. Lyons	1941	145	Dg	27.2	36	-	Fine sand	do.	25.51	8-16-57	D,S	-	ND.
93	V14-5c	O. Curtis	1952	150	Dg	24.0	40	-	-	do.	19.56	8-16-57	D	-	ND. Y 2.
94	V14-5c	A. Emery	-	150	Dr	140	6	-	-	Bedrock	-	-	D	-	ND. Y 15.
95	V14-5c	French	-	150	Dg	19.0	40	-	-	Ice-contact deposits	16.29	8-16-57	D,N	-	
96	V14-5c	F. Shaw	-	150	Dg	16.5	36	-	Sand	do.	14.68	8-16-57	D	-	
112	V14-6a	R. J. Stecker	1955	145	Dr	-	6	-	-	Bedrock	-	-	Ir	-	ND.
152	V14-5b	A. Allen	1942	160	Dr	212	6	100	-	do.	12	-42	D	-	Y 15.
153	V14-5c	O. Curtis	1951	140	Dg	5.9	24	-	Sand	Ice-contact deposits	4.59	8-16-57	D,N	-	Y 1½.
154	V14-5c	French	1935	150	Dr	167	6	30	-	Bedrock	-	-	D	-	
155	V14-5c	F. Shaw	-	145	Dg	8.7	36	-	Sand	Ice-contact deposits	7.31	8-16-57	S,N	-	
163	V14-6a	R. J. Stecker	-	150	Dg	14	36	-	-	do.	10	7-25-57	D	-	
193	V14-5b	W. Paisley	-	140	Dg	21.7	30	-	-	do.	18.45	7-13-59	D,Ir	C	C.
194	V14-2g	H. W. Nason	-	175	Dg	23.1	48	-	-	Till	14.09	7-13-59	N,O	None	T 52.
253	W14-4a	U. S. Geol. Survey	1959	100	A,T	13	4	13R	-	-	-	-	-	-	A. L.
254	V14-5c	do.	1959	150	A,T	67	4	-	-	-	-	-	-	-	A. L.
255	V14-6c	do.	1959	110	A,T	6.5	4	6.5	-	-	-	-	-	-	A. L.
256	V14-6a	R. Martin	1959	215	Dr	157	6	123	-	Bedrock	Flowed	Spring59	D	J	C. L. Y 10.
257	V14-2j	U. S. Geol. Survey	1960	100	A,T	57	4	57R	-	-	-	-	-	-	A. L.
258	V14-2j	do.	1960	100	A,T	8	4	-	-	-	-	-	-	-	A. L.
259	V14-5b	do.	1960	110	A,T	41	4	41	-	-	-	-	-	-	A. L.
260	V14-5b	do.	1960	130	A,T	60	4	60R	-	-	-	-	-	-	A. L.
261	V14-5b	do.	1960	140	A,T	24	4	24R	-	-	-	-	-	-	A. L.
262	V14-5b	do.	1960	135	A,T	97	4	97R	-	-	-	-	-	-	A. L.
263	V14-6b	do.	1960	150	A,T	12	4	12R	-	-	-	-	-	-	A. L.
267	V14-2j	do.	1960	110	A,T	14	4	14R	-	-	-	-	-	-	A. L.
268	V14-3g	do.	1960	125	A,T	75	4	75R	-	-	-	-	-	-	A. L.

Table 2.--Records of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
							GEORGETOWN								
1,2	Wl4-1d	Town of Georgetown	1930	90	Dn	20-36	-	-	-	Outwash	-	-	T	-	Y 60-75.
3-5	Wl4-3f	do.	1930	80	Dn	67	-	-	-	Ice-contact deposits	-	-	T	-	Y 75 of 3 wells.
6-9	Wl4-3h	do.	1930	90	Dn	-	-	-	-	do.	-	-	T	-	Y 98 of 4 wells.
29	Wl4-3h	do.	1947	90	Dr	125	-	-	-	Bedrock	9	11- -47	PS	-	L. Y 100.
30	Wl4-3h	Ray Jordan	-	190	Dg	12.3	72	-	-	Till	8.48	7-13-59	N,O	None	T 53.
31	Wl4-3j	Donald Batson	-	230	Dg	18.6	24	-	-	do.	3.00	7-13-59	N,O	None	T 57.
32	Wl4-4a	John Reagan	-	140	Dr	167	8	-	-	Bedrock	3.78	7-13-59	N	None	T 55.
33	Wl4-1a	Harry Hunter	1937	90	Dr	104	6	10	-	do.	19.48	7-13-59	N,O	None	Y ½.
34	Wl4-1a	do.	-	80	Dg	4.6	36	-	-	Ice-contact deposits	1.64	7-13-59	N	None	D.
35	Wl4-2e	William Phillips	-	80	Dg	24.6	30	-	-	do.	22.19	7-15-59	D,O	Pn	ND. T 48.
36	Wl4-1a	Chester Richardson	-	95	Dg	14.9	30	-	Sand	do.	10.80	7-22-59	N,O	H	C. T 55.
37	Wl4-2e	U. S. Geol. Survey	1959	45	A,T	30	-	30R	-	-	-	-	-	-	A. L.
38	Wl4-2e	do.	1959	60	A,T	40	-	40R	-	-	-	-	-	-	A. L.
39	Wl4-2a	do.	1959	70	A,T	36	-	36R	-	-	-	-	-	-	A. L.
40	Wl4-1e	do.	1959	80	A,T	17	-	17R	-	-	-	-	-	-	A. L.
41	Wl4-2b	do.	1959	60	A,T	72	-	72R	-	-	-	-	-	-	A. L.
42	Wl4-1f	do.	1959	75	A,T	62	-	62R	-	-	-	-	-	-	A. L.
43	Wl4-1b	do.	1959	85	A,T	4	-	4R	-	-	-	-	-	-	A. L.
44	Vl4-6c	Mathew Kelloway	1952	150	Dr	182	8-6	-	-	Bedrock	-	-	C	C	C. T 50. Y 9.
45	Wl4-4b	George Morse	1921	95	Dg	7.0	40	-	-	Outwash	4.85	8-10-60	D	J	C. T 55.
46	Wl4-1c	Duane Snow	1900	80	Dg	8.0	18-60	-	-	Ice-contact deposits	2.73	8-23-60	N	None	T 60.
47	Wl4-2d	Maurice Spaulding	1940	75	Dr	53	8	15	-	Bedrock	-	-	N	None	PD. Y 3-4.
48	Wl4-1c	Ernest Pepin	1900	85	Dg	21.7	48	-	Gravel	Outwash	19.20	8-16-60	D	J	PD. T 51.
49	Wl4-2d	Dudley Tenny	1650	60	Dg	13.8	36	-	Sand	Ice-contact deposits	10.91	8-17-60	N	None	ND. T 53.
50	Wl4-1c	James Nagle	1900	75	Dg	12.5	24-40	-	Gravel	Outwash	9.69	8-23-60	N	None	T 55.
51	Wl4-1e	Mary Enos	1910	80	Dg	18.7	24-48	-	do.	Ice-contact deposits	16.49	8-23-60	D	C	C. T. 51
52	Wl4-1h	Stanley Konieczny	1955	100	Dn	34.0	3½	-	do.	do.	16.40	8-25-60	D	Pn	T 51. Water reportedly is sometimes slightly yellow.
53	Wl4-1d	William Kimball	1800	85	Dg	14.5	36	-	do.	do.	14.5	8-25-60	N	None	T 51.
54	Wl4-4a	Town of Georgetown	1956	110	Dn	12	2½	12R	-	-	-	-	T	-	L.
57	Wl4-4a	do.	1956	100	Dn	18	2½	18R	-	-	-	-	T	-	L.
58	Wl4-4a	do.	1956	100	Dn	54	2½	54R	Medium to coarse sand and boulders	Ice-contact deposits	2.3	11- -56	T	-	C. L.
63	Wl4-4a	do.	1956	90	Dn	23	2½	23R	-	-	-	-	T	-	L.
64	Wl4-1g	do.	1956	80	Dn	13	2½	13R	-	-	-	-	-	-	
65	Wl4-1g	do.	1956	80	Dn	13	2½	13R	-	-	-	-	T	-	L.
66	Wl4-1g	do.	1956	85	Dn	17	2½	17R	-	-	-	-	-	-	
67	Wl4-1h	do.	1956	90	Dn	20	2½	20R	-	-	3.5	11- -56	T	-	L.
68	Wl4-1h	do.	1956	80-90	Dn	13	2½	13R	-	-	-	-	-	-	
69	Wl4-1h	do.	1956	80-90	Dn	18	2½	-	-	-	-	-	-	-	
70	Wl4-1j	do.	1956	105	Dn	60	2½	60R	-	-	2.5	11- -56	T	-	L.
71	Wl4-1j	do.	1956	100	Dn	41.5	2½	41.5R	Coarse sand and gravel	Ice-contact deposits	6.0	11- -56	T	-	C. L.
76	Wl4-1j	do.	1956	95	Dn	43	2½	43R	-	-	2.5	11- -56	T	-	L.

Table 2.--Records of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

Well no.	Location	Owner or user	Year com-pleted	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								GEORGETOWN (Continued)							
79	W14-1j	Town of Georgetown	1956	105	Dn	17	2½	17R	-	-	-	-	T	-	L.
81	W14-1j	do.	1956	80	Dn	26	2½	26R	-	-	5.0	11- -56	-	-	
82	W14-1j	do.	1956	80	Dn	3	2½	3R	-	-	-	-	T	-	L.
85				90		4		4R							
86	W14-1j	do.	1956	80	Dn	2	2½	2R	-	-	-	-	T	-	L.
89						3		3R							
90	W14-1j	do.	1956	90	Dn	20	2½	20R	-	-	-	-	T	-	L.
93	W14-1j	do.	1956	90	Dn	53	2½	53R	-	-	6	11- -56	T	-	L.
96	W14-4a	do.	1956	95	Dn	55	2½	55R	Sand and gravel	Outwash	1.0	11- -56	T	-	L.
97	W14-4a	do.	1956	95	Dn	47	2½	47R	do.	do.	-	11- -56	T	-	C.
98	W14-4a	do.	1956	95	Dn	47	2½	47R	do.	do.	-	11- -56	T	-	L.
99	W14-4a	do.	1956	95	Dn	33	2½	33R	-	-	-	-	T	-	L.
101	W14-2d	do.	1956	80	Dn	32	2½	32R	Sand and clay	Marine deposits	1.0	11- -56	T	-	L.
104	W14-1j	do.	1956	95	Dn	18	2½	18R	-	-	-	-	T	-	L.
105	W14-1j	do.	1956	95	Dn	18	2½	18R	-	-	-	-	-	-	
106	W14-1j	do.	1956	105	Dn	32	2½	32R	-	-	-	11- -56	-	-	
107	V14-6c	do.	1957	110	Dn	15	2½	15R	Fine sand and clay	Till	-	-	T	-	L.
108	V14-6c	do.	1957	100	Dn	24	2½	24R	do.	do.	-	5- -57	-	-	
109	V14-6c	do.	1957	100	Dn	7	2½	7	-	-	-	5- -57	-	-	
112	W14-4a	do.	1957	105	Dn	27	2½	27R	Fine to medium sand	Ice-contact deposits	2.9	5- -57	T	-	L.
113	W14-1g	do.	1957	100	Dn	20	2½	20R	-	-	-	-	T	-	L.
114	W14-1g	do.	1957	100	Dn	18	2½	18R	Fine sand and clay	Ice-contact deposits	-	5- -57	-	-	
115	V14-3f	do.	1957	100	Dn	29	2½	29R	Sand, gravel, rock	do.	3.0	5- -57	T	-	L.
117	V14-3f	do.	1957	90	Dn	54	2½	54R	Fine to medium sand	do.	11.0	5- -57	T	-	L.
118	V14-3f	do.	1957	90	Dn	20	2½	20R	Sand and gravel	do.	2.5	5- -57	T	-	L.
120	V14-3h	do.	1957	85	Dn	29	2½	29R	Silt and sand	do.	3.0	5- -57	T	-	L.
121	V14-3h	do.	1957	85	Dn	29	2½	29R	do.	do.	4.9	5- -57	T	-	
123	V14-3h	do.	1957	100	Dn	37	2½	37R	Sand and gravel	do.	3.9	5- -57	T	-	L.
126	V14-3h	do.	1957	90	Dn	42	2½	42R	do.	do.	1.5	5- -57	T	-	L
127	V14-3h	do.	1957	90	Dn	47	2½	-	do.	do.	1.3	5- -57	T	-	C. L. Y 50.
133	V14-3e	do.	1957	90	Dn	45	2½	-	Sand	do.	1.4	5- -57	T	-	L.
134	V14-3h	do.	1957	85	Dn	36	2½	36R	Sand and gravel	do.	1.6	5- -57	T	-	L.
135	V14-3h	do.	1934	90	Dn	36 av.	2½	-	Sand and fine gravel	do.	-	-	PS	-	Y 200 of 19 wells.
153															
155	W14-1d	do.	1948	75	Dn	24	2½	24R	Fine to coarse sand and gravel	do.	-	-	T	-	L.
156	W14-1g	do.	1948	100	Dn	16	2½	16R	-	-	-	-	T	-	L.
157	W15-7j	U. S. Geol. Survey	1960	65	A,T	11	4	11R	-	-	-	-	-	-	A. L.
158	W14-1c	do.	1960	65	A,T	31	4	31R	-	-	-	-	-	-	A. L.
159	W14-1c	do.	1960	65	A,T	16½	4	16½R	-	-	-	-	-	-	A. L.

Table 2.--Records of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								GEORGETOWN (Continued)							
160	W14-1c	U. S. Geol. Survey	1960	65	A,T	15	4	15R	-	-	-	-	-	-	A. L.
161	W14-1b	do.	1960	65	A,T	12	4	12R	-	-	-	-	-	-	A. L.
164	V14-3d	do.	1960	85	A,T	16	4	16R	-	-	-	-	-	-	A. L.
166	V14-3e	do.	1960	105	A,T	47	4	47R	-	-	-	-	-	-	A. L.
167	V14-3h	do.	1960	130	A,T	40	4	40R	-	-	-	-	-	-	A. L.
								GROVELAND							
9	W15-7g	Mrs. Murphy	1805	105	Dg	17.0	36-60	-	-	Till	Dry	8-24-60	D	-	D.
10	W15-7h	U. S. Geol. Survey	1960	65	A,T	16	4	16R	-	-	-	-	-	-	A. L.
12	V15-9h	do.	1960	100	A,T	16	4	-	-	-	-	-	-	-	A. L.
13	V15-9h	do.	1960	90	A,T	24	4	24R	-	-	-	-	-	-	A. L.
14	V15-9f	do.	1960	100	A,T	15	4	-	-	-	-	-	-	-	A. L.
16	V15-9f	do.	1960	95	A,T	15	4	15R	-	-	-	-	-	-	A. L.
								IPSWICH							
104	X14-5d	Town of Ipswich	1957	13	Dn,T	10	2½	-	-	-	-	-	-	-	A. L.
105	X14-5d	do.	1957	16	Dn,T	2.5	2½	2.5R	-	-	-	-	-	-	A. L.
106	X14-5d	do.	1957	27	Dn,T	15	2½	-	-	-	-	-	-	-	A. L.
107	X14-4f	do.	1957	27	Dn,T	15	2½	-	-	-	-	-	-	-	A. L.
113	X14-4f	do.	1957	43	Dn,T	61	2½	-	-	-	-	-	-	-	A. L.
136	X14-4a	do.	1941	20	Dn	44	2½	-	Gravel	Ice-contact deposits?	-	-	T	-	A. L. Y 21; dd 9.
137	W14-6c	do.	1941	40	Dn	10	2½	-	-	-	-	-	T	-	A. L.
138	W14-6c	do.	1941	40	Dn	17	2½	17R	-	-	-	-	T	-	A. L.
139	X14-4d	do.	1941	30	Dn	10	2½	10R	-	-	-	-	T	-	A. L.
140	X14-4d	do.	1942	40	GP	48	-	48R	Gravel	Ice-contact deposits	-	-	PS	C	L. Y 200.
141	X14-4a	do.	1941	40	Dn	45	2½	45R	-	-	-	-	T	-	A. L.
142	X14-4a	do.	1941	40	Dn	56	2½	-	-	-	-	-	T	-	A. L.
143	X14-4d	do.	1941	40	Dn	48	2½	48R	Gravel	Ice-contact deposits?	-	-	T	-	A. L. Y 52; dd 10.
144	X14-4d	do.	1941	40	Dn	63	2½	-	-	-	-	-	T	-	A. L.
145	X14-4d	do.	1941	40	Dn	49	2½	49R	-	-	-	-	T	-	A. L.
146	X14-4d	do.	1941	40	Dn	26	2½	26R	Gravel	Ice-contact deposits?	-	-	T	-	A. L. Y 20.
147	X14-4d	do.	1941	30	Dn	16	2½	16R	-	-	-	-	T	-	A. L.
148	X14-4d	do.	1941	40	Dn	24	2½	24R	-	-	-	-	T	-	A. L.
149	W14-6f	do.	1941	60	Dn	12	2½	12R	-	-	-	-	T	-	A. L.
150	W14-6f	do.	1941	50	Dn	43.6	2½	-	Sand and gravel	Marine deposits	-	-	T	-	A. L. Y 20.
151	W14-6f	do.	1941	45	Dn	17	2½	-	-	-	-	-	T	-	A. L.
152	W14-6f	do.	1941	45	Dn	30	2½	30	-	-	-	-	T	-	A. L.
153	W14-6e	do.	1941	60	Dn	28	2½	28	-	-	-	-	T	-	A. L.
210	X14-4e	do.	1954	30	GP	55	-	55R	Sand and gravel	Marine deposits	-	-	PS	T	L. Y 500.
211	X14-4e	do.	1954	30	Dn	52.2	2½	52.2R	do.	do.	-	-	T	-	A. L. Y 50; dd 1.0.
223	X14-1h	M. I. T. Lincoln Lab	1955	15	Dn,T	49.0	2	-	-	-	4.0	8- -55	-	-	A. L.
224	X14-1h	do.	1955	10	Dn,T	47.5	2	47.5R	-	-	0.0	8- -55	-	-	A. L.
225	X14-1j	do.	1955	10	Dn,T	17.0	2	17.0R	-	-	0.0	8- -55	-	-	A. L.

Table 2.--Records of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
							IPSWICH (Continued)								
226	X14-1j	M. I. T. Lincoln Lab	1955	5	Dn,T	19.3	2	19.3R	-	-	0.0	8- -55	-	-	A. L.
227	X14-1h	do.	1955	79	Dn,T	15.0	2	15.0R	-	-	8.0	8- -55	-	-	A. L.
228	X14-1j	do.	1955	70	Dn,T	7.0	2	7.0R	-	-	-	-	-	-	A. L.
229	X14-1j	do.	1955	70	Dn,T	30.0	2	-	-	-	8.5	8- -55	-	-	A. L.
230	X14-1j	do.	1955	10	Dn,T	5.0	2	5.0R	-	-	-	-	-	-	A. L.
231	X14-1j	do.	1955	10	Dn,T	10.8	2	10.8R	-	-	-	-	-	-	A. L.
232	X14-1h	do.	1955	10	Dn,T	22.3	2	22.3R	-	-	1.5	8- -55	-	-	A. L.
235	X14-4e	Boston & Maine R. R.	1931	45	Dn,T	60.0	-	-	-	-	1.2	5- -31	-	-	A. L.
246	X14-4e	Town of Ipswich	1958	33.5	Dn,T	65.5	2	65.5R	-	-	6.0	6- -58	-	-	A. L.
247	X14-4e	do.	1958	39.3	Dn,T	76.0	2	-	-	-	5.0	6- -58	-	-	A. L.
248	X14-1j	M. I. T. Lincoln Lab	1958	10	Dn,T	18.0	2	18.0R	-	-	-	-	-	-	A. L.
249	X14-1j	do.	1958	10	Dn,T	23.0	2	23.0R	-	-	-	-	-	-	A. L.
250	X14-1j	do.	1958	10	Dn,T	52.0	2	-	-	-	-	-	-	-	A. L.
251	X14-1j	do.	1958	10	Dn,T	26.0	2	-	-	-	-	-	-	-	A. L.
252	X14-1h	do.	1958	10	Dn,T	26.0	2	-	-	-	4.0	5- -58	-	-	A. L.
253	X14-1h	do.	1958	10	Dn,T	26.0	2	-	-	-	1.5	5- -58	-	-	A. L.
254	X14-1h	do.	1958	10	Dn,T	7.5	2	7.5R	-	-	1.0	5- -58	-	-	A. L.
257	X14-1h	do.	1958	10	Dn,T	25.0	2	-	-	-	4.5	5- -58	-	-	A. L.
298	X14-5c	U. S. Geol. Survey	1958	28	A	23	4	23R	-	-	-	-	-	-	A. L.
299	X14-5c	do.	1958	31	A	27	4	27R	-	-	-	-	-	-	A. L.
300	X14-5a	do.	1958	10	A	4	4	4R	-	-	-	-	-	-	A. L.
301	X14-5a	do.	1958	9	A	16	4	-	-	-	-	-	-	-	A. L.
302	X14-5a	do.	1958	5	A	15	4	-	-	-	-	-	-	-	A. L.
303	X14-5a	do.	1958	5	A	77	4	77R	-	-	-	-	-	-	A. L.
309	X14-4a	do.	1958	30	A	75	4	75R	-	-	-	-	-	-	A. L.
310	X14-4e	do.	1958	70	A	11	4	11R	-	-	-	-	-	-	A. L.
311	X14-4e	do.	1958	65	A	13	4	13R	-	-	-	-	-	-	A. L.
312	X14-4e	do.	1958	60	A	21	4	21R	-	-	-	-	-	-	A. L.
313	X14-4e	do.	1958	50	A	30	4	30R	-	-	-	-	-	-	A. L.
332	X14-3g	do.	1960	10	A	50	4	50R	-	-	-	-	-	-	A. L.
							NEWBURY								
2-	W15-8c	Mass.Dept.Pub.Wks.	1950-	51.5-	Dn,T	0-	-	0-	-	-	-	-	-	-	A. L.
11			1951	62.6		12.6		12.6R							
24	W15-8j	Town of Newbury	-	30	Dg	28.2	48	-	-	Marine deposits	13.33	7-14-59	N,O	-	T 53.
25	W15-9a	A. L. Cunningham	1750	30	Dg	15.3	-	-	-	Till	9.38	7-14-59	N,O	None	T 52.
26	W15-9f	Town of Newbury	-	20	Dg	13.6	120	-	-	Till?	1.64	7-14-59	F,O	None	T 61.
27	W15-8h	George E. Brown	1914	55	Dg	19.9	31-48	-	"Hard gravel"	Till	8.58	7-20-59	N,O	None	C. L. T 53.
31	X15-7j	Ernest Dower	1956	30	Dg	23	24	-	Sand	Marine deposits	17.57	9- 4-59	D	J	L. PD.
32	X15-7h	U. S. Geol. Survey	1959	45	A,T	53	4	53R	-	-	-	-	-	-	A. L.
33	X15-7f	do.	1959	70	A,T	81	4	81R	-	-	-	-	-	-	A. L.
36	X15-4g	do.	1959	45	A,T	82	4	-	-	-	-	-	-	-	A. L.
37	W15-8j	do.	1959	50	A,T	53	4	53R	-	-	-	-	-	-	A. L.
38	W14-2c	do.	1959	45	A,T	70	4	70R	-	-	-	-	-	-	A. L.
39	X14-7j	Archie Pollock	-	30	Dg	20	24	-	Sand and clay	Marine deposits	17-18	4-25-60	D	Pn	C. L. T 51. Y 4.
40	W15-9a	Donald Hudson	1955	50	Dr	194	6	0	-	Bedrock	-	-	D	Pn	C. T 49. Y 15.
41	X15-7h	Albin Galinis	1957	30	Dr	120	6	65	-	do.	-	-	D	C	C. T 52.

Table 2.--Records of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

Well no.	Location	Owner or user	Year com-pleted	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
							NEWBURY (Continued)								
45	W15-9f	Lawrence Brown	1915	15	Dg	9.0	60	-	Clay, sand, and gravel	Marine deposits	2.51	7-19-60:	S	Pn	T 54. Well reportedly overflows in spring.
46	W15-9c	Fenn's Motors	1960	20	Dr	130	6	28	-	Bedrock	6	6- -60:	C	C	Y 10-12.
47	W15-8j	Annette Palmer	1700	20	Dg	18.6	48	18.6	-	Till	12.20	7-20-60:	N	None	T 52.
48	W14-2c	William Weber	-	60	Dg	14.2	48	-	"Clay"	Marine deposits	8.35	7-20-60:	N	None	ND. T 51.
49	W14-2c	Doris Richtmyer	1700	20	Dg	5.5	96	-	Clay and sand	do.	0.33	7-20-60:	D,S	Pn	ND. T 51.
50	W15-9c	George Emerson	1959	20	Dr	155	6	14	-	Bedrock	8	6- -60:	D	J	Y 5.
51	W15-9c	William Shannon	1951	25	Dr	35	4	10	-	do.	4	-51:	D	J	PD. Y 3½.
52	X15-7f	Clifford Purdy	1960	65	Dr	37	6	6	-	do.	14	6- -60:	D	Pn	F. Y 60.
53	X15-7b	Leonard Isley	1959	30	Dr	205	8-6	16	-	do.	16	2- -59:	D,S	Pn	Y 9.
54	W15-9c	Robert Harlow	1957	15	Dg	14.3	36	-	"Clay"	Marine deposits	7.93	7-18-60:	D	Pn	T 50.
55	W15-8c	Samuel Ordway	-	65	Dg	13.5	48	13.5	-	Till	5.95	7-17-60:	D	Pn	T 53.
56	X15-7f	Bertram Noyes	1945	20	Dn	80	2	-	Coarse gravel	Marine deposits?	20	-45:	D	Pn	L. ND.
57	X15-7b	Helen and Elizabeth Knight	1760	50	Dg	43.5	60	-	Sand and clay	Marine deposits	36.80	7-15-60:	N	None	T 50. Well reportedly could not be pumped dry with fire pump.
58	X15-7b	Melville Pratt	1926	30	Dg	20.0	48	-	do.	do.	12.66	7-15-60:	N	None	T 48. Well reportedly could not be pumped dry with 2 cylinder gas pump and 1 HP electric pump.
59	W15-8j	Mrs. Kalahalis	1800	50	Dg	20.0	36-48	-	do.	do.	11.41	8-17-60:	D	Pn	C. PD. T 47.
60	W15-8h	Guy Rogers	1840	70	Dg	14.9	36-48	-	Sand and gravel	do.	10.92	8-15-60:	D	Pn	ND. T 53.
61	W14-2a	Joseph Haydock	1700	60	Dg	15.0	36-48	-	do.	do.	14.30	8-16-60:	N	None	T 52.
62	W15-8g	James Lowe	1900	80	Dg	19.2	72	0	-	Bedrock	17.35	8-19-60:	N	B	D. T 51.
63	X15-7h	Arnold Burns	1940	15	Dg	13.8	48	-	-	Marine deposits	10.00	8-19-60:	D	H	D. T 51.
64	W15-9c	Eben Young	1956	10	Dr	102	6	0	-	Bedrock	11	8-12-60:	D	Pn	Y 12. Well reportedly cannot be pumped dry with present pump.
65	W15-8g	Town of Newbury	-	70	Dg	20.9	96	-	-	Marine deposits	10.50	8-24-60:	F	None	T 50. Water has strong odor.
66	W14-3a	John Harrington	1870	40	Dg	10.5	96	-	Clay	do.	4.77	8-24-60:	D,S	Pn	ND. T 52.
67	X15-7h	Mustafa Trod	-	40	Dg	24.2	36	-	Clay	do.	7.75	9- 9-60:	D	Pn	C. ND. T 55.
68	W15-8g	William Senior	1951	65	Dn	15	1¼	15	Sand and gravel	do.	2	-51:	D	C	C. ND. T 57. Water has strong musty odor.
69	W15-9f	George Houle	1915	45	Dr	125	4	0	-	Bedrock	-	-	D	J	
70	W15-9c	McGlew	1960	20	Dr	152	6	8	-	do.	-	-	D	J	C. T 52. Y 30; dd 0 after 4 hours pumping.
71-82	W14-2b	Byfield Water District	1948	10-20	Dn	30-45	2½	-	Sandy gravel	Marine deposits	-	-	PS	-	L. Y 150 of 12 wells. Hardness is reportedly 100-110 ppm.
83	W15-9h	Governor Dummer Academy	1930	50	Dr	118	-	0	-	Bedrock	-	-	Ir	-	Y 14.
84	W14-3b	do.	-	40	Dr	165	-	4	-	do.	-	-	PS	Pn	Y 5-11.

Table 2.--Records of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

Well no.	Location	Owner or user	Year com-pleted	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
							NEWBURY (Continued)								
85	W14-3b	Governor Dummer Academy	1957	30	Dr	190	-	-	-	Bedrock	-	-	PS	-	C.
86	W14-3b	do.	1944	55	Dr	229	-	10	-	do.	-	-	PS	C	C. Y 17.
87	W15-9h	do.	1960	10	Dn,T	25	2	-	-	-	-	5-[illegible] -60	-	-	
88	W15-9h	do.	1960	15	Dn,T	51	2	-	-	-	-	-	-	-	L.
89	W15-9h	do.	1960	20	Dn,T	25	2	-	-	-	-	-	-	-	
90	X15-8j	U. S. Geol. Survey	1960	10	A,T	111	4	111R	-	-	-	-	-	-	A. L.
91	X15-7b	do.	1960	45	A,T	45	4	45R	-	-	-	-	-	-	A. L.
92	W15-9h	do.	1960	15	A,T	69	4	69R	-	-	-	-	-	-	A. L.
93	X15-7b	do.	1960	8	A,T	84	4	84R	-	-	-	-	-	-	A. L.
							NEWBURYPORT								
5	W15-6j	Hytron Corp.	1870	15	Dg	40	14 ft.	-	-	Marine deposits	-	-	C	-	T 60. Y 60.
34- 39	W15-6f	Mass.Dept.Pub.Wks.	1934	63.5- 71.3	Dn,T	25- 35	-	25R- 35R	-	-	-	-	-	-	L.
40- 49	W15-6g	do.	1950	22.0- 24.5	Dn,T	22.7- 35.4	-	22.7R- 35.4R	-	-	-	-	-	-	A. L.
50- 59	W15-6d	do.	1950	81.4- 82.9	Dn,T	-	-	8.5R- 17.2R	-	-	-	-	-	-	A. L.
60- 69	W15-6d	do.	1950	81.2- 95.7	Dn,T	12.2- 35.5	-	12.2R- 35.5R	-	-	-	-	-	-	A. L.
70	W15-6g	W. E. Sweeney	1939	25.0	Dg	15.2	36	15.2R	"Rocks"	Marine deposits?	2.28	7-14-59	S,O	Pn	C. T 53. Surface water enters well during wet seasons.
71	W15-6f	U. S. Geol. Survey	1959	30	A,T	57	4	-	-	-	-	-	-	-	A. L.
73	W15-6j	James H. Bothwell	-	10	Dg	6.1	60	-	Clay	Marine deposits	+1.0	7-19-60	S	None	C. ND. T 50.
74	W15-6g	Robert Henderson	1950	25	Dr	45	6	8-10	-	Bedrock	-	-	D	Pn	ND. Y 1½-3.
76	W15-6j	City of Newburyport	1893	5	Dn	110	2½	-	-	-	-	-	T	-	A. L. Y none.
77	W15-6j	do.	1893	5	Dn	85	2½	-	-	-	-	-	T	-	A. Y none.
78	W15-6j	do.	1893	3.8	Dn	42	2½	-	Fine blue gravel	Marine deposits	+5.8	10- -93	T	-	F 45. Well reportedly flowed at undiminished rate for 13 years C.
79	W15-6h	do.	1893	7.2	Dn	34	2½	-	do.	do.	+2.3	10- -93	T	-	F 20. Y 75.
80	W15-6j	do.	1893	6.7	Dn	38	2½	38	do.	do.	+2.3	10- -93	T	-	F 20. Y 75.
81	W15-6j	do.	1893	6.2	Dn	51	2½	51	do.	do.	+4.0	10- -93	T	-	C. F 10. L. Y 50.
82	W15-6j	do.	1893	6.3	Dn	54	2½	54	do.	do.	+4.7	10- -93	T	-	F 30.
83	W15-6j	do.	1893	7.6	Dn	65½	2½	65½	do.	do.	+3.6	10- -93	T	-	F 10. Y 70.
84	W15-6j	do.	1893	-	Dn	65.8	2½	65.8	-	-	-	-	T	-	Y none.
86	W15-6h	do.	1893	8.5	Dn	74	2½	74	Fine blue gravel	Marine deposits	+3.2	10- -93	T	-	F 15. L.
87	W15-6h	do.	1893	11	Dn	66½	2½	66½	do.	do.	0.5	10- -93	T	-	Y 20.
88	W15-6h	do.	1893	13.1	Dn	30½	2½	30½	Blue gravel	do.	2.8	10- -93	T	-	Y 50.
89	W15-6h	do.	1893	13	Dn	11	2½	11	-	-	-	-	T	-	
90	W15-6h	do.	1893	13.4	Dn	15.0	2½	15.0	Blue gravel	Marine deposits	1.2	10- -93	T	-	Y 35.
91	W15-6h	do.	1893	14.5	Dn	16.3	2½	16.3	do.	do.	2.4	10- -93	T	-	L. Y 45.

Table 2.--Records of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
								NEWBURYPORT (Continued)							
92	W15-6h	City of Newburyport	1893	14.1	Dn	34.6	2½	-	Hard gravel, broken stones	Marine deposits	2	10-93	T	-	Y 75.
93	W15-6h	do.	1893	14.2	Dn	34	2½	34	Coarse blue gravel	do.	2	10-93	T	-	Y 78.
94	W15-6h	do.	1893	14.3	Dn	37.3	2½	37.3	Blue gravel	do.	2.3	10-93	T	-	Y 78.
95	W15-6h	do.	1893	14.4	Dn	34	2½	34	do.	do.	1.7	10-93	T	-	L. Y 60.
96	W15-6h	do.	1893	14.4	Dn	25.8	2½	25.8	Fine sand and clay	do.	2.0	10-93	T	-	Y 70.
97	W15-6h	do.	1893	14.6	Dn	48	2½	48	Coarse gravel	do.	2.4	10-93	T	-	Y 70.
98	W15-6h	do.	1893	15.1	Dn	41.5	2½	41.5	Blue gravel	do.	2	10-93	T	-	Y 72.
99	W15-6h	do.	1893	15.2	Dn	34.8	2½	34.8	do.	do.	2.1	10-93	T	-	Y 80.
100	W15-6h	do.	1893	15.6	Dn	26	2½	26	do.	do.	2.4	10-93	T	-	L. Y 78.
101	W15-6f	do.	1893	16.9	Dn	17.5	2½	17.5	Blue quicksand	do.	3.9	10-93	T	-	Y 48.
102	W15-6f	do.	1893	15	Dn	20.5	2½	20.5	-	-	-	-	T	-	Y none.
103	W15-6f	do.	1893	17.7	Dn	36.0	2½	36.0	Blue quicksand	Marine deposits	1	10-93	T	-	Y 54.
104	W15-6f	do.	1893	19.1	Dn	63.5	2½	-	Hard fine gravel	do.	2	10-93	T	-	L. Y 65.
105	W15-6f	do.	1893	20	Dn	11.5	2½	11.5	-	-	-	-	T	-	Y none.
106	W15-6f	do.	1893	25	Dn	43	2½	43	-	-	-	-	T	-	L. Y none.
107	W15-6h	do.	1893	8	Dn	84	2½	84	-	-	-	-	T	-	Y none.
108	W15-6e	do.	1893	18	Dn	21.5	2½	21.5	Hard gravel	Marine deposits	1	10-93	T	-	Y 30.
109	W15-6e	do.	1893	17.7	Dn	53	2½	53	Very hard gravel	do.	+0.3	10-93	T	-	L. Y 72.
110	W15-6e	do.	1893	20	Dn	35	2½	35	Hard blue gravel	do.	1	10-93	T	-	L. Y none.
112	W15-6h	do.	1893	15	Dn	9	2½	9	-	-	-	-	T	-	Y none.
113	W15-6g	do.	1893	10.3	Dn	38.5	2½	38.5	Very hard blue gravel	Marine deposits	+0.5	10-93	T	-	F 25. L. Y 95.
114	W15-6g	do.	1893	15	Dn	57.8	2½	57.8	-	-	-	-	T	-	L. Y none.
115	W15-6h	do.	1893	14.3	Dn	59	2½	59	Blue gravel	Marine deposits	2	10-93	T	-	Y 75.
116	W15-6e	do.	1957	50	Dn	40	2½	40	-	-	0.1	6-57	T	-	L.
117	W15-6d	do.	1957	50	Dn	72	2½	72R	Sand, gravel, and clay	Marine deposits	5.8	6-57	T	-	L. Y 65.
118	W15-6d	do.	1957	50	Dn	37.8	2½	37.8R	-	-	0.1	6-57	T	-	
119	W15-6d	do.	1957	60	Dn	44.5	2½	44.5R	-	-	2.3	6-57	T	-	
132	W15-6d	do.	1957	45	Dn	27.8	2½	27.8R	Clay and gravel	Marine deposits	2.0	6-57	T	-	L.
133	W15-6a	do.	1957	100	Dn	29.5	2½	29.5R	Coarse sand and gravel	Ice-contact and marine deposits	10.0	6-57	T	-	L.
134	W15-6a	do.	1957	100	Dn	26.2	2½	26.2R	do.	do.	12	6-57	T	-	
135	W15-6a	do.	1957	85	Dn	82.5	2½	82.5	Fine sand and clay	do.	8.0	6-57	T	-	L.
136	W15-6g	do.	1957	25	Dn	53.5	2½	53.5R	Sand, gravel, some clay	Marine deposits	2.4	6-57	T	-	L. T 52. Y 100.

Table 2.--Records of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

Well no.	Location	Owner or user	Year completed	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
							NEWBURYPORT (Continued)								
137	W15-6g	City of Newburyport	1957	25	Dn	64.5	2½	64.5R	Medium sand and gravel	Marine deposits	-	-	T	-	F. L. Y 50.
138	W15-6g	do.	1957	20	Dn	24	2½	24R	-	-	2	6- -57	T	-	
139	W15-6g	do.	1957	30	Dn	46	2½	46R	-	-	2.3	6- -57	T	-	L.
140	W15-6g	do.	1957	20	Dn	77.7	2½	77.7R	-	-	2.5	6- -57	T	-	L.
141	W15-6g	do.	1957	25	Dn	50.6	2½	-	Sand, gravel, some clay	Marine deposits	-	-	T	-	Y 60; dd 4.7.
143	W15-5f	do.	1957	40	Dn	15.5	2½	15.5R	-	-	-	-	T	-	L.
144	W15-5j	do.	1957	30	Dn	28	2½	28R	Clay and gravel	Till?	0	6- -57	T	-	L.
145	W15-6d	do.	1957	45	Dn	23	2½	23R	-	-	0	6- -57	T	-	L.
146	W15-6d	do.	1957	35	Dn	25.5	2½	25.5R	-	-	-	-	T	-	L.
147	W15-6f	U. S. Geol. Survey	1960	15	A,T	90	4	90R	-	-	-	-	-	-	A. L.
							ROWLEY								
1-	W14-3j	Town of Rowley	1949	55	Dn	18-	2.0	-	Fine gravel	Ice-contact deposits?	-	-	PS	-	Y 346 of 16 wells.
16						35									
17	W14-6a	Owen Lloyd	-	85	Dg	26.3	36	-	-	Ice-contact deposits	14.44	9- 5-58	D	Pn	ND.
18	W14-6a	do.	-	75	Dg	13.6	36	-	-	do.	11.10	9- 5-58	N	None	
19	W14-6a	Charles Balser	-	95	Dg	19.1	36	-	-	Till	16.60	9- 5-58	D	Pn	
20	W14-6a	John DeCoste	-	90	Dg	18	36	-	-	do.	16	9- 5-58	D	H	D
21	W14-5c	Henry Britton	-	85	Dg	13.6	36	-	-	do.	7.00	9- 5-58	N	None	T 60.
22	W14-5b	George Sutherland	-	75	Dg	9.3	24	-	-	do.	7.05	9- 5-58	D	T	ND.
25	W14-5b	-	-	75	Dg	13.7	30	-	-	Ice-contact deposits	11.03	9- 5-58	D	H	
26	W14-5f	H. C. Budd	1930	75	Dg	10.5	48	-	-	do.	7.50	9- 5-58	D	Pn	
27	W14-3f	A. E. Murray	-	40	Dg	15.3	36	19- 20R	-	Marine deposits	12.12	7-15-59	N,O	None	T 50.
28	W14-5a	William Blanchard	-	60	Dg	12.2	72	-	-	Outwash	7.64	7-15-59	D,O	Pn	ND. T 53.
29	W14-3f	D. E. Dillingham	-	35	Dg	12.45	24	-	"Gravel"	Till?	4.90	8- 5-59	N	None	T 56.
30	W14-6a	Town of Rowley	1959	55	GP	37.5	24	-	Coarse sand and gravel	Ice-contact deposits	3.9	8-26-59	PS	-	T 49.
31	W14-5a	U. S. Geol. Survey	1959	70	A,T	55	4	55R	-	-	-	-	-	-	A. L.
32	W14-5c	do.	1959	70	A,T	53	4	53R	-	-	-	-	-	-	A. L.
33	W14-2j	do.	1959	60	A,T	35	4	35R	-	-	-	-	-	-	A. L.
34	W14-3d	Town of Rowley	1956	35	Dn	21.1	2½	21.1R	-	-	3.9	2-13-56	T	-	
35	W14-3d	do.	1956	35	Dn	27.8	2½	27.8R	-	-	+1.9	2-13-56	T	-	L.
36	W14-3d	do.	1956	30	Dn	27.5	2½	-	Brown sand and gravel	Marine deposits	-	-	T	-	L. Y 12.
37	W14-3d	do.	1956	35	Dn	8	2½	8R	-	-	0	2-15-56	T	-	
38	W14-3d	do.	1956	35	Dn	15	2½	15R	-	-	0	2-15-56	T	-	L.
39	W14-3d	do.	1956	30	Dn	26.1	2½	26.0R	-	-	1.6	2-16-56	T	-	L.
41	W14-3e	do.	1956	45	Dn	5.1	2½	5.1R	-	-	2.9	2-16-56	T	-	L.
42	W14-3d	do.	1956	40	Dn	22.7	2½	22.7R	-	-	0	2-17-56	T	-	L.
43	W14-3b	do.	1956	25	Dn	28.3	2½	28.3R	-	-	1.3	2- 2-56	T	-	
44	W14-3e	do.	1956	15	Dn	35.0	2½	35.0R	Gravel and "broken stone"	Ice-contact deposits?	2.9	2- 3-56	T	-	L. Y 10.
45	W14-3e	do.	1956	45	Dn	26.5	2½	-	-	-	3.3	2-23-56	T	-	L.

Well no.	Location	Owner or user	Year com-pleted	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock: or refusal: (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
							ROWLEY (Continued)								
46	W14-3e	Town of Rowley	1956	40	Dn	21.7	2½	-	Sand, gravel, some clay	Marine deposits	2.3	2-24-56	T	-	L. Y 4.
47	W14-3e	do.	1956	30	Dn	20.2	2½	20.2R	Medium sand and gravel	do.	1.1	2-27-56	T	-	L. Y 2.
48	W14-3e	do.	1956	30	Dn	17.6	2½	17.6R	-	-	3	2-27-56	T	-	L.
49	W14-3f	do.	1956	40	Dn	18.2	2½	18.2R	-	-	1.1	2-29-56	T	-	L.
50	W14-6a	do.	1956	55	Dn	17.3	2½	17.3R	Medium sand, fine gravel	Outwash	2.4	2-29-56	T	-	L. Y 5.
52	W14-6a	do.	1956	55	Dn	25.9	2½	25.9R	Fine to medium sand, coarse gravel	do.	1.3	3- 1-56	T	-	L. Y 40.
56	W14-6a	do.	1956	60	Dn	20	2½	20R	-	-	2.9	3- 3-56	T	-	L.
57	W14-6a	do.	1956	60	Dn	17.8	2½	-	Brown sand and coarse gravel	Ice-contact deposits	0.7	3- 5-56	T	-	Y 3.
58	W14-6a	do.	1956	55	Dn	33.4	2½	33.4R	Medium sand and coarse gravel	Outwash	0.6	3- 5-56	T	-	Y 28.
59	W14-4f	do.	1956	85	Dn	21.9	2½	21.9R	-	-	-	-	T	-	L.
60	W14-4f	do.	1956	70	Dn	3.5	2½	3.5R	-	-	-	-	T	-	
61	W14-4f	do.	1956	70	Dn	10.2	2½	10.2R	-	-	-	-	T	-	
62	W14-5a	do.	1956	65	Dn	31.2	2½	31.2R	Fine to medium sand:	Outwash	2.1	4- 3-56	T	-	L. Y 12.
63	W14-5c	do.	1956	70	Dn	17.9	2½	17.9R	-	-	-	-	T	-	
64	W14-5c	do.	1956	70	Dn	19.4	2½	19.4R	Fine sand and gravel	Ice-contact deposits	-	-	T	-	L. Y 10.
65	W14-6a	do.	1956	55	Dn	58.3	2½	58.3R	Coarse sand and gravel	do.	0.9 14.5	4- 4-56 7-25-60	T	-	L. Y 30.
66	W14-6a	do.	1956	55	Dn	37.5	2½	37.5R	do.	do.	3.5	7-25-60	T	-	Y 100.
67	W14-6a	do.	1956	55	Dn	59.6	2½	-	Fine to medium sand and gravel	do.	3.7 7.5	4-30-56 7-25-60	T	-	Y 20.
68	W14-5a	Malcolm Shute	-	65	Dg	-	48	-	Sand	Outwash	-	-	D	Pn	C. T 50. Y 2-4.
69	W14-5b	-	1960	95	Dr	-	6	8	Till	Bedrock	-	-	D	-	Well not completed on date of inventory, 7-17-60.
70	X14-2a	Ivan Kent	1945	5	Dg	12.7	24	-	Clay	Marine deposits	7.40	7-13-60	D	None	A. L. ND. T 52. Water reportedly became "slightly brackish" in summer 1957.
71	W14-2h	William Herrick	1920	65	Dg	15.1	24	-	Sand	Outwash	10.35	8-18-60	D	Pn	C. PD. T 53.
72	W14-3j	Charles Mighill	1800	55	Dg	18.2	48	18.2?	-	Marine deposits	13.50	8-19-60	D,N	None	D. T 52.
73	W14-3h	Arthur Bear	1952	165	Dr	326	6	-	-	Bedrock	-	-	D	Pn	ND. Y 8-9.
74	W14-2h	J. H. Hall	-	70	Dg	13.0	24	13.0	Gravel	Outwash	10.79	8-22-60	D,N	None	D. T 51.
75	W14-5a	Kenneth Morse	1930	70	Dg	8.5	36	-	Sand	do.	5.44	8-26-60	D	Pn	ND. T 58.
76	W14-2g	Mrs. J. E. Dane	-	170	Dg	21.6	24-30	-	-	Till	16.91	8-22-60	N	None	T 50.
77	W14-2g	do.	-	145	Dr	240	8-6	-	-	Bedrock	-	-	N	None	Y 4.
78	W14-2g	John Ewell	-	180	Dr	250	-	-	-	do.	-	-	D	-	Y 15.
79	W15-2g	Byard Tuckerman	1937	180	Dr	250	-	-	-	do.	-	-	D	-	Y 17.

Table 2.--Records of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

Well no.	Location	Owner or user	Year com-pleted	Altitude of land-surface datum (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth to bedrock or refusal (feet)	Principal water-bearing material: Character	Principal water-bearing material: Geologic unit	Water: Level	Water: Date of measurement	Water: Use	Water: Type of pump	Remarks
						ROWLEY (Continued)									
81	X14-1g	Town of Rowley	1945	20	Dn	24	2½	-	Gravel and clay	Marine deposits	-	-	T	-	L.
82	W14-3h	do.	1945	60	Dn	31	2½	-	do.	do.	-	-	T	-	L. Y 42; dd 5.3 after 17 hours pumping.
84	W14-3f	do.	1945	30	Dn	54	2½	-	do.	do.	-	-	T	-	L.
85	W14-3j	do.	1945	55	Dn	35	2½	-	Gravel	Ice-contact deposits?	-	-	T	-	L. Y 87 of 3 wells.
87	X14-1g	do.	1945	50	Dn	78.8	2½	-	Clay, sand, and gravel	Marine deposits	-	-	T	-	L.
98	X14-2a	M. I. T. Lincoln Lab	1955	5	Dn,T	61.0	1	-	-	-	2.0	8- -55	-	-	A. L.
99	X14-2a	do.	1955	5	Dn,T	32.0	1	-	-	-	0.0	8- -55	-	-	A. L.
100	X14-2a	do.	1955	15	Dn,T	31.0	1	-	-	-	-	-	-	-	A. L.
101	X14-2a	do.	1955	5	Dn,T	35.5	1	-	-	-	-	-	-	-	A. L.
102	X14-2a	do.	1955	10	Dn,T	30.0	1	-	-	-	12.0	8- -55	-	-	A. L.
						WEST NEWBURY									
1	W15-7a	Herbert Sargent	-	100	Dg	32.0	36	-	-	Till	20.1	7-14-59	N,O	None	C. T 52.
2	W15-7a	Frank Gowen	1914	80	Dg	10.0	60	10	Sand	Marine deposits	2.69	7-14-59	N,O	None	T 60.
5	W15-7c	Isabelle Hoopes	-	90	Dg	26.0	48	-	-	Till	15.52	7-17-60	N	Pn	T 50.
6	W15-7b	Dan Hurld	1960	215	Dr	237	6	86	-	Bedrock	30.0	3- -60	D	J	Y 4.
7	W15-7c	Isabelle Hoopes	1949	95	Dr	140	6	16	-	do.	-	-	D	J	Y 5-7.
8	W15-8d	Arthur Elwell	1730	80	Dg	14.0	36	-	-	Till	8.62	8-25-60	D	Pn	ND. T 55.
9	W15-4g	Frank Coombs	1930	105	Dg	21.1	36	-	Sand, gravel, clay	do.	10.68	8-23-60	N	None	ND. T 51.
10	W15-8d	Charles Rogers	1850	90	Dg	18.7	40	18.7	Gravel	Marine deposits	12.70	8-13-60	D,N	None	ND. T 52.
11	W15-7e	M. P. Pearson	1947	200	Dg	21.3	36	-	-	Till	8.05	8-22-60	D	C	T 52.
12	W15-7e	Mary Brown	-	100	Dg	15.3	36-48	-	-	do.	8.02	8-22-60	N	None	T 56.
13	W15-4h	Raymond Weigel	1954	205	Dr	237	6	119	-	Bedrock	-	-	D	Pn	ND.
14	W15-8c	James McGann	1953	65	Dr	123	6	5	-	do.	14	-53	D	C	ND. Y 10.
15	W15-7e	Lyman Orgland	-	210	Dg	26.9	48	-	-	Till	11.10	8-22-60	N	None	ND. T 50.
16	W15-7b	Donald Shepard	1949	110	Dr	108	6	19	-	Bedrock	-	-	D,S	J	Y 30.
17	W15-7b	U. S. Geol. Survey	1960	90	A,T	14.8	4	14.8R	-	-	-	-	-	-	A. L.
19	W15-7a	do.	1960	70	A,T	21	4	21R	-	-	-	-	-	-	A. L.

Table 3.--Logs of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts

(Thicknesses and depths below land-surface are given in feet)

	Thickness	Depth
BOXFORD 253. Alt. about 100 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, medium to coarse, brown, angular	13	13
Refusal:		
Bedrock or boulder		at 13
Auger hole in pit about 8 ft. below original land surface.		
BOXFORD 254. Alt. about 150 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to medium, brown; becoming finer and gray-brown at depth	67	67
BOXFORD 255. Alt. about 110 ft.		
Geologist's log of auger hole.		
Fill	6.5	6.5
Refusal:		
Bedrock		at 6.5
Auger hole in pit about 10 ft. below original land surface.		
BOXFORD 256. Alt. about 115 ft.		
Driller's log of water well.		
Till:		
Clayey gravel	123	123
Bedrock	34	157
BOXFORD 257. Alt. about 100 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to very coarse, angular to rounded, poorly sorted, brown	35	35
Sand, fine to coarse, mostly fine; and gravel, fine, rounded to angular	12	47
Gravel	0.5	47.5
Sand	2.5	50
Gravel	7	57
Refusal:		
Bedrock or boulder		at 57
Auger hole in pit about 20 ft below original land surface.		
BOXFORD 258. Alt. about 100 ft.		
Geologist's log of auger hole.		
Fill	1	1
Swamp deposits:		
Peat, and sand, gray-black	4	5
Ice-contact deposits:		
Gravel	0.5	5.5
Sand	1.5	7
Sand, fine to coarse, angular to rounded, poorly sorted; and gravel, fine to medium, mostly well rounded	1	8
BOXFORD 259. Alt. about 110 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, very fine to very coarse, mostly fine, rounded, very well sorted, yellow, quartz; a little silt	6	6
Gravel, fine to medium, angular; and silt, gray	29	35
Till:		
Clay, silt, and gravel, fine to medium	6	41
Refusal:		
Bedrock		at 41
Auger hole in pit about 10 ft. below original land surface.		
BOXFORD 260. Alt. about 130 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to medium, angular, well-sorted, yellow-brown	6	6
Gravel, fine, angular to slightly rounded; and sand, medium to very coarse, angular to slightly rounded quartz	1	7
Silt, gray-blue, and sand	5	12
Gravel layer		at 12
Silt	1	13
Sand, fine to medium, angular to slightly rounded quartz; and gravel, fine to medium, rounded	6	19
BOXFORD 260.--Continued		
Till:		
Silt, blue-gray, sand, fine to very coarse, and gravel, fine, mostly angular	31	50
Clay, blue-gray, silt, sand, very fine to very coarse, gravel, fine, angular, and boulders	10	60
Refusal:		
Bedrock or boulder		at 60
BOXFORD 261. Alt. about 140 ft.		
Geologist's log of auger hole.		
Till:		
Silt, brown, sand, fine to very coarse, angular, poorly sorted, and gravel, fine	6	6
Silt, clay, pebbles, small, angular, and cobbles	9	15
Clay, silt, and gravel, fine to medium, angular to rounded	5	20
Clay, gray, sand, fine to very coarse, and gravel, fine to medium	4	24
Refusal:		
Bedrock or boulder		at 24
BOXFORD 262. Alt. about 135 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, very fine to very coarse, mostly angular to slightly rounded, some well sorted beds, brown, mostly quartz grains; and gravel, fine to medium, slightly rounded	10	10
Gravel, fine to medium, rounded to slightly rounded	1	11
Sand, fine to very coarse, mostly medium to coarse, angular to slightly rounded, mainly quartz	7	18
Sand, fine to very coarse, mostly fine and medium, mostly angular to slightly rounded, well sorted beds, quartz; gravel	29	47
Sand, fine to coarse, angular to slightly rounded, well sorted beds, brown, mostly quartz	44	91
Till:		
Gravel and silt, gray	6	97
Refusal:		
Bedrock or boulder		at 97
BOXFORD 263. Alt. about 150 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Cobbles, coarse; sand; and gravel	4	4
Sand, mostly very fine, angular; and silt	1	5
Sand, very fine to coarse, mostly very fine, angular; silt; and gravel, fine to medium, angular to slightly rounded	7	12
Refusal:		
Bedrock or boulder		at 12
This log is representative of 2 auger holes at this site.		
BOXFORD 267. Alt. about 110 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, very fine to coarse, mostly very fine to fine, angular to rounded, well sorted, brown	7	7
Gravel, fine to medium	6	13
Gravel, coarse	1	14
Refusal:		
Bedrock or boulder		at 14
This log is representative of 3 auger holes at this site.		
BOXFORD 268. Alt. about 125 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to very fine, angular to slightly rounded, very well sorted	71	71
BOXFORD 268.--Continued		
Till:		
Clay, gray, and gravel	4	75
Refusal:		
Bedrock or boulder		at 75
GEORGETOWN 29. Alt. about 90 ft.		
Driller's log of public-supply well.		
Ice-contact deposits:		
Topsoil	1	1
Gravel and boulders	13	14
Sand, coarse	12	26
Till?:		
Hardpan	18	44
Bedrock:		
Mica rock	81	125
GEORGETOWN 37. Alt. about 45 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, silty, brown; very little fine gravel	20	20
Refusal:		
Bedrock or boulder		at 20
Auger hole in pit about 10 ft. below original land surface.		
GEORGETOWN 38. Alt. about 60 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine, silty, brown	20	20
Marine deposits:		
Clayey silt, brown; becoming gray clayey silt	40	40
Refusal:		
Bedrock or boulder		at 40
GEORGETOWN 39. Alt. about 70 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, medium, yellow brown, few granules	7	7
Sand, medium, brown	10	17
Sand, fine, silty, yellow, wet	10	27
Sand, very fine, silty, yellow	2	29
Sand, very fine, silty, gray	3	32
Clay, cohesive, blue gray	4	36
Refusal:		
Bedrock or boulder		at 36
GEORGETOWN 40. Alt. about 80 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, medium to coarse, angular, brown	17	17
Refusal:		
Bedrock or boulder		at 17
Auger hole in pit about 6 ft. below original land surface.		
GEORGETOWN 41. Alt. about 60 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, fine to medium, silty, brown	40	40
Sand, fine, silty, gray-brown	20	60
Sand, fine, silty, gray, with much silt	12	72
Refusal:		
Bedrock or boulder		at 72
GEORGETOWN 42. Alt. about 75 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, fine to medium, silty, brown	40	40
Sand, fine to medium, silty, gray	15	55
Marine deposits:		
Clayey silt, cohesive, gray	7	62
Refusal:		
Bedrock or boulder		at 62
GEORGETOWN 43. Alt. about 85 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sandy gravel, coarse	4	4
Refusal:		
Bedrock or boulder		at 4
This log is representative of 3 auger holes at this site.		

	Thickness	Depth
GEORGETOWN 54. Alt. about 110 ft.		
Driller's log of test well.		
Till:		
Sand, coarse, brown, gravel, and boulders	12	12
Refusal		at 12
This log is representative of 3 test wells at this site.		
GEORGETOWN 57. Alt. about 100 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	4	4
Ice-contact deposits?:		
Sand, coarse, brown; gravel and boulders	14	18
Refusal		at 18
GEORGETOWN 58. Alt. about 100 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	4	4
Ice-contact deposits:		
Sand, coarse, brown; gravel	12	16
Sand, coarse, red	1	17
Sand, fine to medium, gray	2	19
Sand, medium to coarse, brown	5	24
Sand, medium to fine, gray	6	30
Sand, medium to coarse, brown	7	37
Sand, fine to medium, brown	5	42
Sand, medium to coarse, brown; boulders	10	52
Till?:		
Gravel, sharp, blue, and sand	2	54
Refusal		at 54
This log is representative of 3 test wells at this site.		
GEORGETOWN 63. Alt. about 90 ft.		
Driller's log of test well.		
Outwash:		
Topsoil	2	2
Sand, coarse	6	8
Till?:		
Gravel, sharp, blue, and sand	6	14
Gravel, sharp, blue, and sand, fine	9	23
Refusal		at 23
This log is representative of 3 test wells at this site.		
GEORGETOWN 65. Alt. about 85 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Sand, coarse, brown, and boulders	11	13
Refusal		at 13
This log is representative of test wells Georgetown 64-66.		
GEORGETOWN 67. Alt. about 90 ft.		
Driller's log of test well.		
Outwash:		
Sand, brown, gravel, and boulders	18	18
Till:		
Sand, sharp, gray; gravel type hardpan	2	20
Refusal		at 20
This log is representative of test wells Georgetown 67-69.		
GEORGETOWN 70. Alt. about 105 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Gravel, coarse, brown	13	15
Sand, coarse, brown	5	20
Sand, fine, gray	27	47
Clay	2	49
Gravel, coarse, gray	3	52
Till?:		
Gravel, coarse, sharp, gray, and sand, fine	8	60
Refusal		at 60
GEORGETOWN 71. Alt. about 100 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Gravel, coarse, brown, and sand	16	18
Sand, medium, brown	6	24
Sand, fine, gray; traces of clay	9	33
Gravel, coarse, brown and gray; sand	8.5	41.5
Refusal		at 41.5
GEORGETOWN 76. Alt. about 95 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Sand, coarse, brown; gravel	20	22
Sand, fine, gray	14	36
Sand, sharp, gray and brown; gravel	7	43
Refusal		at 43
This log is representative of 2 test wells at this site.		
GEORGETOWN 79. Alt. about 105 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	1	1
Sand, medium, brown, and gravel	13	14
Till?:		
Gravel, sharp, blue gray, and clay	3	17
Refusal		at 17
GEORGETOWN 85. Alt. about 85 ft.		
Driller's log of test well.		
Outwash:		
Sand, coarse, brown; gravel and boulders	4	4
Refusal:		
Boulders		at 4
This log is representative of test wells Georgetown 82-85.		
GEORGETOWN 89. Alt. about 80 ft.		
Driller's log of test well.		
Outwash:		
Sand, coarse, brown; gravel and boulders	3	3
Refusal:		
Boulders		at 3
This log is representative of test wells Georgetown 86-89.		
GEORGETOWN 90. Alt. about 90 ft.		
Driller's log of test well.		
Outwash:		
Subsoil and boulders	6	6
Gravel, sharp, gray; and sand, fine	12	18
Sand, coarse, brown	2	20
Refusal		at 20
GEORGETOWN 93. Alt. about 90 ft.		
Driller's log of test well.		
Outwash:		
Topsoil	1	1
Sand, brown, and gravel	19	20
Sand, fine, gray	28	48
Till?:		
Gravel, sharp, gray, and sand, fine	5	53
Refusal		at 53
This log is representative of 3 test wells at this site.		
GEORGETOWN 96. Alt. about 95 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	4	4
Outwash:		
Sand, fine, light tan, and gravel	18	22
Sand, fine, light tan	22	44
Gravel, sharp, brown and gray	6	50
Till:		
Clay, red, sand, fine, red, and sharp gravel	2	52
Sharp white stone	3	55
Refusal		at 55
This log is representative of 3 test wells at this site.		
GEORGETOWN 98. Alt. about 95 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	18	18
Outwash:		
Sand, fine, gray-brown	7	25
Sand and gravel, medium, brown	20	45
Till?:		
Sharp gravel and sand	2	47
Refusal		at 47
This log is representative of test wells Georgetown 97 and 98.		
GEORGETOWN 99. Alt. about 95 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	2	2
GEORGETOWN 99.--Continued		
Outwash:		
Sand, coarse, gray, and gravel	14	16
Sand, coarse, brown, and gravel	5	21
Sand, coarse, gray	8	29
Till:		
Boulders and hardpan	4	33
Refusal		at 33
This log is representative of 2 test wells at this site.		
GEORGETOWN 101. Alt. about 80 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	1	1
Marine deposits:		
Sand, medium, gray; traces of clay	20	21
Sand, coarse, brown; traces of clay	8	29
Till?:		
Gravel, sharp, gray	3	32
Refusal		at 32
This log is representative of 2 test wells at this site.		
GEORGETOWN 104. Alt. about 95 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Sand, fine, brown	11	13
Till?:		
Boulders	5	18
Refusal		at 18
This log is representative of test wells Georgetown 104-106.		
GEORGETOWN 107. Alt. about 110 ft.		
Driller's log of test well.		
Till:		
Topsoil	3	3
Sand, fine, brown and clay; tight	10	13
Clay, brown, and sand; very tight	2	15
Refusal		at 15
This log is representative of test wells Georgetown 107-109.		
GEORGETOWN 112. Alt. about 105 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Sand, fine, brown	5	7
Sand, fine to medium, gray-brown; tight	15	22
Sand, fine, gray; tight	5	27
Refusal		at 27
GEORGETOWN 113. Alt. about 100 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Sand, fine, gray, and clay	15	17
Clay, hard, gray	3	20
Refusal		at 20
This log is representative of test wells Georgetown 113 and 114.		
GEORGETOWN 115. Alt. about 100 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Clay, brown, and silt	13	15
Sand, gray-brown; gravel and rock; tight	3	18
Sand, fine to medium, gray-brown; gravel and rock	11	29
This log is representative of 2 test wells at this site.		
GEORGETOWN 117. Alt. about 90 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Sand, fine, yellow; silt	22	24
Sand, fine-medium, gray; tight	10	3
Sand, fine, gray; tight	8	42
Sand, fine to medium, gray; very tight	6	48
Sand, fine, gray	6	54
Refusal		at 54

Table 3.--Logs of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

	Thickness	Depth
GEORGETOWN 118. Alt. about 90 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Sand, fine, yellow, and silt	7	9
Sand, fine, yellow-gray, gravel and silt	6	15
Sand, fine to medium, gray-brown, and gravel; very tight	5	20
Refusal		at 20
This log is representative of 2 test wells at this site.		
GEORGETOWN 120. Alt. about 85 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Topsoil	2	2
Clay, brown, and silt	22	24
Sand, brown, and silt, tight	5	29
Refusal		at 29
This log is representative of 2 test wells at this site.		
GEORGETOWN 123. Alt. about 100 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	4	4
Ice-contact deposits:		
Sand, fine, gray, and silt	8	12
Sand, fine, gray-brown, and gravel	5	17
Sand, fine to medium, gray-brown, and gravel; tight	10	27
Sand, fine, brown, and gravel; very tight	10	37
Refusal		at 37
This log is representative of 3 test wells at this site.		
GEORGETOWN 126. Alt. about 90 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	7	7
Ice-contact deposits:		
Sand, fine, gray, and silt	20	27
Sand, fine, yellow	9	36
Sand, fine to medium, yellow, and gravel	4	40
Till:		
Hardpan	2	42
Refusal		at 42
GEORGETOWN 127. Alt. about 90 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	6	6
Ice-contact deposits:		
Sand, fine, yellow, and gravel	23	29
Sand, fine to medium, yellow, and gravel; traces of clay	10	39
Sand, fine, gray-brown, and gravel; tight	8	47
This log is representative of 6 test wells at this site.		
GEORGETOWN 133. Alt. about 90 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	3	3
Ice-contact deposits:		
Sand, fine, gray-brown, and gravel	4	7
Sand, fine, yellow	21	28
Sand, fine, yellow-gray	9	37
Sand, fine, gray, gravel, and clay; tight	5	42
Till:		
Hardpan	3	45
GEORGETOWN 134. Alt. about 85 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	16	16
Ice-contact deposits:		
Silt, soft, gray	14	30
Sand, fine, gray, and silt	2	32
Sand, fine to medium, yellow-gray; some gravel	4	36
Refusal		at 36
GEORGETOWN 155. Alt. about 75 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Sand, fine to coarse, and gravel	24	24
GEORGETOWN 155.--Continued		
Refusal		at 24
This log is representative of 2 test holes at this site.		
GEORGETOWN 156. Alt. about 100 ft.		
Driller's log of test well.		
Ice-contact deposits?:		
Hardpan	16	16
Refusal		at 16
This log is representative of 2 test holes at this site.		
GEORGETOWN 157. Alt. about 65 ft.		
Geologist's log of auger hole.		
Marine deposits and outwash, undifferentiated:		
Soil	2	2
Gravel	2	4
Clay	2	6
Sand	3	9
Gravel	2	11
Refusal		at 11
GEORGETOWN 158. Alt. about 65 ft.		
Geologist's log of auger hole.		
Outwash and marine deposits, undifferentiated:		
Sand, fine to very coarse, angular, and gravel, fine	7	7
Sand	7	14
Gravel	2	16
Gravel, fine, and sand	4	20
Gravel	3	23
Sand	2	25
Till?:		
Sand and gravel	3	28
Gravel	3	31
Refusal:		
Bedrock or boulder		at 31
GEORGETOWN 159. Alt. about 65 ft.		
Geologist's log of auger hole.		
Fill	6	6
Outwash:		
Sand, fine to very coarse, angular, poorly sorted, gray; silt; and gravel, fine, angular	2	8
Gravel, coarse; reported by driller	2	10
Gravel, medium; reported by driller	4	14
Cobbles and boulders; reported by driller	$2\frac{1}{2}$	$16\frac{1}{2}$
Refusal		at $16\frac{1}{2}$
GEORGETOWN 160. Alt. about 65 ft.		
Geologist's log of auger hole.		
Fill	2	2
Outwash:		
Sand, silt, and gravel, fine; poorly sorted	2	4
Sand; gravel, fine to medium, well rounded	$\frac{1}{2}$	$4\frac{1}{2}$
Swamp deposits:		
Peat	$5\frac{1}{2}$	10
Ice-contact deposits?:		
Gravel, coarse	5	15
Refusal		at 15
GEORGETOWN 161. Alt. about 65 ft.		
Geologist's log of auger hole.		
Swamp deposits:		
Organic matter; sand	2	2
Outwash and marine deposits, undifferentiated:		
Gravel	1	3
Sand	3	6
Gravel	$\frac{1}{2}$	$6\frac{1}{2}$
Sand, soft	$5\frac{1}{2}$	12
Refusal:		
Bedrock or boulder		at 12
This log is representative of 3 auger holes at this site.		
GEORGETOWN 164. Alt. about 85 ft.		
Geologist's log of test hole.		
Fill	5	5
Ice-contact deposits:		
Sand and gravel	4	9
Sand, gravel, coarse, and cobbles	7	16
Refusal		at 16
This log is representative of 2 auger holes at this site.		
GEORGETOWN 166. Alt. about 105 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine, angular, very well sorted, yellow brown	14	14
Sand, fine to medium, some very coarse, angular, very well sorted, brown,	11	25
Silt, fine, well sorted	5	30
Gravel, fine to coarse	17	47
Refusal:		
Bedrock or boulder		at 47
Auger hole in pit about 8 ft. below original land surface.		
GEORGETOWN 167. Alt. about 130 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to very coarse, rounded to angular, poorly sorted, brown; and gravel, fine to medium, mostly rounded	8	8
Gravel, fine to medium, rounded to slightly rounded	7	15
Sand, fine to coarse, angular, poorly sorted; and gravel, fine to medium, mostly rounded, well sorted	20	35
Gravel, coarse	5	40
Refusal:		
Bedrock or boulder		at 40
GROVELAND 10. Alt. about 65 ft.		
Geologist's log of auger hole.		
Fill	5	5
Swamp deposits and outwash, undifferentiated:		
Swamp deposits, and sand, fine to coarse, mostly coarse, mostly angular, well sorted, mostly quartz.	10	15
Gravel, coarse	1	16
Refusal:		
Bedrock or boulder		at 16
This log is representative of 2 auger holes at this site.		
GROVELAND 12. Alt. about 100 ft.		
Geologist's log of auger hole.		
Till:		
Clayey, with sand and gravel.	16	16
GROVELAND 13. Alt. about 90 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Topsoil	1	1
Sand and gravel	3	4
Sand, coarse, angular to slightly rounded, well sorted, mostly quartz	16	20
Till:		
Contains gravel and boulders.	4	24
Refusal:		
Bedrock or boulder		at 24
GROVELAND 14. Alt. about 100 ft.		
Geologist's log of auger hole.		
Till:		
Mostly silt and clay, with sand, fine; rock fragments, angular	10	10
Clay and boulders	5	15
GROVELAND 16. Alt. about 95 ft.		
Geologist's log of auger hole.		
Ice-contact and marine deposits, undifferentiated:		
Groveland sand	3	3
Sand	6	9
Clay	1	10
Gravel, fine to medium, rounded to angular, and sand	1	11
Clay	4	15
Refusal:		
Bedrock or boulder		at 15
IPSWICH 104. Alt. about 13 ft.		
Driller's log of test hole.		
Marine deposits:		
Loam and clay	1.5	1.5
Clay, medium, yellow	3.0	4.5
Till:		
Sand, gravel, boulders, trace of clay	5.5	10

Table 3.--Logs of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

	Thickness	Depth
IPSWICH 105. Alt. about 16 ft.		
Driller's log of test hole.		
Marine deposits:		
Sandy loam	1.5	1.5
Sand and gravel	1.0	2.5
Refusal		at 2.5
IPSWICH 106. Alt. about 27 ft.		
Driller's log of test hole.		
Marine deposits:		
Loam, clay, and sand	2.5	2.5
Clay, medium, yellow, and some fine sand	8.0	10.5
Clay, medium, yellow, and trace of sand	4.5	15
IPSWICH 107. Alt. about 27 ft.		
Driller's log of test hole.		
Marine deposits:		
Loam, sand, and clay	2.5	2.5
Clay, medium, yellow, and trace of fine sand	12.5	15
IPSWICH 113. Alt. about 43 ft.		
Driller's log of test hole.		
Marine deposits:		
Loam	2	2
Sand, medium, yellow	3.5	5.5
Clay, medium, yellow, and trace of fine sand	7.5	13
Clay, soft, blue	42.5	55.5
Sand, medium, yellow, gravel, and clay	5.5	61
IPSWICH 136. Alt. about 20 ft.		
Driller's log of test well.		
Swamp deposits:		
Mud	2	2
Marine deposits:		
Clay, blue	34	36
Ice-contact deposits?:		
"Good gravel"	3	39
Till:		
Hard-packed gravel and clay	5	44
IPSWICH 137. Alt. about 40 ft.		
Driller's log of test well.		
Till?:		
Hardpan; hard driving	10	10
Boulders		at 10
IPSWICH 138. Alt. about 40 ft.		
Driller's log of test well.		
Marine deposits?:		
Topsoil	2	2
Blue gravel	13	15
Till?:		
Hard gravel, clay; hard driving	2	17
Refusal:		
Boulders or bedrock		at 17
IPSWICH 139. Alt. about 30 ft.		
Driller's log of test well.		
Till?:		
Hardpan	10	10
Refusal:		
Boulders or bedrock		at 10
IPSWICH 140. Alt. about 40 ft.		
Driller's log of public-supply well.		
Marine deposits:		
Topsoil, brown sand	4	4
Clay, brown	11	15
Sand, gray	25	40
Sand	1	41
Ice-contact deposits?:		
"Good gravel"	7	48
Refusal:		
Boulders		at 48
IPSWICH 141. Alt. about 40 ft.		
Driller's log of test well.		
Marine deposits:		
Topsoil	3	3
Clay, red, and sand	15	18
Clay	16	34
Sand, gray, and clay; hard driving	11	45
Refusal:		
Boulders		at 45
IPSWICH 142. Alt. about 40 ft.		
Driller's log of test well.		
Marine deposits:		
Topsoil	3	3
Sand, fine, and clay	47	50
IPSWICH 142.--Continued		
Till?:		
Sand, gravel, and clay	6	56
IPSWICH 143. Alt. about 40 ft.		
Driller's log of test well.		
Swamp deposits:		
Mud	3	3
Marine deposits:		
Clay, brown	7	10
Clay, gray	31	41
Clay, gray, and gravel	1	42
Ice-contact deposits?:		
Gravel	6	48
Refusal:		
Bedrock or boulder		at 48
IPSWICH 144. Alt. about 40 ft.		
Driller's log of test well.		
Marine deposits:		
Topsoil	2	2
Sand and clay layers	13	15
Clay, gray, soft	44	59
Till?:		
Gravel and clay, tight	4	63
IPSWICH 145. Alt. about 40 ft.		
Driller's log of test well.		
Marine deposits:		
Topsoil, clay	11	11
Clay, gray	38	49
Refusal:		
Bedrock		at 49
IPSWICH 146. Alt. about 40 ft.		
Driller's log of test well.		
Marine deposits:		
Mud and clay	11	11
Ice-contact deposits?:		
Hardpan	2	13
Gravel	13	26
Refusal:		
Boulders		at 26
IPSWICH 147. Alt. about 30 ft.		
Driller's log of test well.		
Till?:		
Boulders, hardpan	16	16
Refusal:		
Boulders		at 16
IPSWICH 148. Alt. about 40 ft.		
Driller's log of test well.		
Marine deposits:		
Topsoil, clay	11	11
Ice-contact deposits?:		
Hard-packed gravel	9	20
Till?:		
Boulders	4	24
Refusal:		
Boulders or bedrock		at 24
IPSWICH 149. Alt. about 60 ft.		
Driller's log of test well.		
Till?:		
Not described	12	12
Refusal:		
Boulders or bedrock		at 12
IPSWICH 150. Alt. about 50 ft.		
Driller's log of test well.		
Marine deposits:		
Sand and gravel	27	27
Clay	16	43
Till?:		
Hardpan	0.6	43.6
IPSWICH 151. Alt. about 45 ft.		
Driller's log of test well.		
Marine deposits:		
Gravel, sand, and clay	17	17
IPSWICH 152. Alt. about 45 ft.		
Driller's log of test well.		
Marine deposits and till, undifferentiated:		
Clay, boulders	30	30
Refusal:		
Bedrock		at 30
IPSWICH 153. Alt. about 60 ft.		
Driller's log of test well.		
Marine deposits:		
Sand and gravel	12	12
Gravel and clay	5	17
Till?:		
Hardpan	11	28
IPSWICH 153.--Continued		
Refusal:		
Bedrock		at 28
IPSWICH 210. Alt. about 30 ft.		
Driller's log of public-supply well.		
Marine deposits:		
Clay, some small stones at top	21.9	21.9
Clay	8.9	30.8
Clay, some sharp gravel; tight	2.2	33.0
Sand, gravel, clay	5.5	38.5
Sand, medium	5.4	43.9
Sand and gravel, medium, some sharp	5.5	49.4
Sand, fine to medium, and sharp gravel	5.6	55.0
Refusal		at 55.0
IPSWICH 211. Alt. about 30 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, some small stones at top	24.0	24.0
Clay, medium sand, and sharp gravel; tight	3.9	27.9
Clay, some gravel	5.5	33.4
Clay, sand, and gravel	5.5	38.9
Sand, medium	5.4	44.3
Sand, medium, and sharp gravel	4.8	49.1
Not described	3.1	52.2
Refusal		at 52.2
IPSWICH 223. Alt. about 15 ft.		
Driller's log of test hole.		
Marine deposits:		
Sand, fine, hard, and some clay	4.5	4.5
Sand, yellow, loose, and clay	8.5	13.0
Clay, blue, soft, and some fine sand	30.0	43.0
Clay, very stiff, sand, fine, and gravel	5.0	48.0
Till?:		
Sand, gravel, and clay; very compact	1.0	49.0
IPSWICH 224. Alt. about 10 ft.		
Driller's log of test hole.		
Salt-water marsh deposits:		
Soft peat	13.0	13.0
Marine deposits:		
Sand, very fine, loose, and little clay	11.0	24.0
Clay, blue, soft	14.0	38.0
Ice-contact deposits?:		
Sand, coarse, and gravel; hard	2.0	40.0
Sand, coarse, and gravel; loose	7.0	47.0
Till?:		
Sand, medium, gravel, and clay	0.5	47.5
Refusal:		
Bedrock or boulder		at 47.5
IPSWICH 225. Alt. about 10 ft.		
Driller's log of test hole.		
Salt-water marsh deposits:		
Peat	6.7	6.7
Marine deposits:		
Clay, blue, medium, and sand, fine	2.3	9.0
Clay, yellow, medium	7.5	16.5
Till:		
Boulders	0.5	17.0
Refusal:		
Bedrock or boulder		at 17.0
IPSWICH 226. Alt. about 5 ft.		
Driller's log of test hole.		
Salt-water marsh deposits:		
Peat	6.0	6.0
Marine deposits:		
Clay, blue, soft	2.0	8.0
Clay, yellow, stiff	11.0	19.0
Till?:		
Sand, medium to coarse, and clay; very compact	0.3	19.3
Refusal:		
Bedrock or boulder		at 19.3

Table 3.--Logs of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

	Thickness	Depth
IPSWICH 227. Alt. about 79 ft.		
Driller's log of test hole.		
Fill:		
Sand, gravel, and clay; very compact	4.0	4.0
Till:		
Sand, gravel, and clay; very compact	11.0	15.0
Refusal:		
Bedrock or boulder		at 15.0
IPSWICH 228. Alt. about 70 ft.		
Driller's log of test hole.		
Till:		
Sandy loam	1.5	1.5
Sand, fine, and gravel; compact	2.5	4.0
Sand, medium, gravel, and clay; very compact	3.0	7.0
Refusal:		
Bedrock or boulder		at 7.0
IPSWICH 229. Alt. about 70 ft.		
Driller's log of test hole.		
Till:		
Sandy loam	1.5	1.5
Sand, fine, and gravel; compact	3.5	5.0
Sand, fine, gravel, and clay; compact	11.0	16.0
Sand, fine, gravel, and some clay; very compact	14.0	30.0
IPSWICH 230. Alt. about 10 ft.		
Driller's log of test hole.		
Marine deposits:		
Topsoil, loamy	1.5	1.5
Sand, fine, and gravel; hard	3.5	5.0
Refusal		at 5.0
IPSWICH 231. Alt. about 10 ft.		
Driller's log of test hole.		
Salt-water marsh deposits:		
Peat	2.0	2.0
Marine deposits:		
Clay, blue, medium, and trace of clay	2.0	4.0
Clay, yellow, medium	3.0	7.0
Clay, yellow, stiff, and sand, fine	3.0	10.0
Till:		
Sand, fine, gravel, and clay; compact	0.8	10.8
Refusal		at 10.8
IPSWICH 232. Alt. about 10 ft.		
Driller's log of test hole.		
Marine deposits:		
Topsoil, loamy, clayey	2.0	2.0
Clay, yellow, stiff	2.0	4.0
Clay, yellow, medium	10.0	14.0
Ice-contact deposits?:		
Sand, medium to coarse, loose, trace of clay	3.0	17.0
Sand, coarse, and gravel; hard	2.0	19.0
Till?:		
Sand, medium, and gravel; very compact	3.3	22.3
Refusal:		
Bedrock or boulder		at 22.3
IPSWICH 235. Alt. about 45 ft.		
Driller's log of test hole.		
Marine deposits:		
Loamy sand, little coarse gravel	14.0	14.0
Sand, coarse, yellow, and gravel, coarse	1.5	15.5
Clay, blue, soft	38.8	54.3
Till?:		
Sand, coarse, gravel, coarse, and clay; hard	5.7	60.0
This log is representative of 4 test holes at this site.		
IPSWICH 246. Alt. 33.5 ft.		
Driller's log of test hole.		
Marine deposits:		
Loam	1.0	1.0
Sand, fine, loamy	1.0	2.0
Sand, fine, loose	2.0	4.0
Sand, fine, firm, and clay	6.0	10.0
Sand, fine, loose, and clay	7.0	17.0
Clay, very soft	47.0	64.0

	Thickness	Depth
IPSWICH 246.--Continued		
Till?:		
Sand, coarse, gravel, some clay; hard	1.0	65.0
Sand, very fine, some gravel, little clay; very compact	0.5	65.5
Refusal		at 65.5
IPSWICH 247. Alt. 39.3 ft.		
Driller's log of test hole.		
Marine deposits:		
Loam and fine sand	3.0	3.0
Sand, fine, brown	4.0	7.0
Sand, fine, brown, and clay	5.0	12.0
Sand, fine, gray, and clay	10.0	22.0
Clay, very soft	49.0	71.0
Sand, coarse, gray	5.0	76.0
Ice-contact deposits?:		
Sand and gravel, compact	-	-
IPSWICH 248. Alt. about 10 ft.		
Driller's log of test hole.		
Salt-water marsh deposits:		
Peat	4.0	4.0
Silt	1.0	5.0
Marine deposits:		
Clay, blue, stiff, trace of yellow clay	5.0	10.0
Clay, yellow, stiff, trace of blue clay	6.0	16.0
Till?:		
Sand, medium, yellow, and gravel; very compact	2.0	18.0
Refusal		at 18.0
IPSWICH 249. Alt. about 10 ft.		
Driller's log of test hole.		
Salt-water marsh deposits:		
Silty peat	9.0	9.0
Silt	1.0	10.0
Marine deposits:		
Clay, blue, stiff	2.0	12.0
Clay, yellow, stiff, trace of blue clay	6.0	18.0
Till?:		
Sand, medium, yellow, compact; coarse gravel and boulders	5.0	23.0
Refusal:		
Bedrock or boulder		at 23.0
IPSWICH 250. Alt. about 10 ft.		
Driller's log of test hole.		
Salt-water marsh deposits:		
Peat	7.5	7.5
Marine deposits:		
Clay, blue, medium	1.5	9.0
Clay, yellow, stiff, trace of blue clay	6.0	15.0
Clay, yellow, medium, trace of blue clay	8.0	23.0
Clay, blue, soft	29.0	52.0
IPSWICH 251. Alt. about 10 ft.		
Driller's log of test hole.		
Salt-water marsh deposits:		
Peat	10.0	10.0
Marine deposits:		
Clay, blue	1.0	11.0
Clay, yellow, very stiff, trace of blue clay	10.0	21.0
Clay, blue, medium	5.0	26.0
IPSWICH 252. Alt. about 10 ft.		
Driller's log of test hole.		
Marine deposits:		
Loam	1.0	1.0
Loamy sand, little clay	1.0	2.0
Clay, yellow, stiff, and sand, fine	6.5	8.5
Clay, yellow, medium, and sand, fine	3.5	12.0
Clay, blue, soft; strata of fine sand	14.0	26.0
This log is representative of test holes Ipswich 252 and 253.		
IPSWICH 254. Alt. about 10 ft.		
Driller's log of test hole.		
Marine deposits:		
Loam	1.0	1.0
Clay, yellow, very stiff, and sand, fine	4.0	5.0
Till?:		
Sand, fine, brown, and gravel; compact; hard	1.5	6.5

	Thickness	Depth
IPSWICH 254.--Continued		
Till?:--Continued		
Sand, fine, and gravel; very compact	1.0	7.5
Refusal:		
Bedrock or boulder		at 7.5
This log is representative of 3 test holes at this site.		
IPSWICH 257. Alt. about 10 ft.		
Driller's log of test hole.		
Marine deposits:		
Loam, loamy sand	2.5	2.5
Sand, fine, yellow, firm, little clay	3.5	6.0
Clay, yellow, medium, and sand, fine	5.0	11.0
Sand, gravel	1.0	12.0
Clay, yellow, medium, and sand	3.5	15.5
Clay, blue, soft	6.5	22.0
Till?:		
Sand, fine, gravel, and boulders; compact	3.0	25.0
IPSWICH 298. Alt. about 28 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Clayey silt, brown, hard, moist, with some lenses of sand and silt	5	5
Clayey silt, with some silt, sand, and pebbles	9	14
Clay, blue-gray, soft; angular rock fragments in lower few feet	9	23
Refusal:		
Bedrock or boulder		at 23
IPSWICH 299. Alt. about 31 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Clayey silt, brown, hard, with some sand and silt in lenses	15	15
Clayey silt, brown, soft, with some sand and silt in lenses	10	25
Clay, brown, with angular rock fragments	2	27
Refusal:		
Bedrock or boulder		at 27
IPSWICH 300. Alt. about 10 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Silt and sand, brown, weathered	4	4
Refusal:		
Boulder or bedrock		at 4
IPSWICH 301. Alt. about 9 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Clayey silt, brown, moist, with sand and silt lenses	7	7
Clayey silt, brown, with gravel, fine to coarse, angular to subangular	5	12
Clay, brown, with thin gravel lenses	1	13
Ice-contact deposits?:		
Sand and gravel, coarse, with much silt	2	15
Till?:		
Gravel, silt, and clay; very dense	1	16
IPSWICH 302. Alt. about 5 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Clayey silt, sand, coarse, and gravel	5	5
Till?:		
Gravel, fine to medium, sand, coarse, much silt, brown	5	10
Gravel, sand, and silt; dense, hard drilling	5	15

Table 3.--Logs of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

	Thickness	Depth
IPSWICH 303. Alt. about 5 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Clayey silt, dark brown, some sand	21	21
Clayey silt, some sand; light brown, changing to gray	52	73
Struck rock		at 73
Till?	4	77
Refusal:		
Bedrock or boulder		at 77
IPSWICH 309. Alt. about 30 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, fine to medium, brown, with much silt	5	5
Sand, fine, brown, some silt	20	25
Sand, gray, with silt and clay	5	30
Clay, gray	45	75
Refusal:		
Bedrock or boulder; angular rock fragments on bit		at 75
Auger hole in pit about 10 ft. below original land surface.		
IPSWICH 310. Alt. about 70 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, coarse, brown, with much silt, some gravel	5	5
Ice-contact deposits?:		
Gravel, fine to coarse, and sand, coarse; some silt	6	11
Refusal:		
Bedrock or boulder		at 11
This log is representative of auger holes Ipswich 310 and 311.		
IPSWICH 312. Alt. about 60 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, coarse, brown, and gravel, fine to medium, with much silt	5	5
Ice-contact deposits?:		
Gravel, fine to coarse, some brown, silty sand	1	6
Sand, very fine to medium, brown, with some silt and gravel	10	16
Sand, fine, brown, with some gravel; gray clay near bottom of hole	5	21
Refusal:		
Bedrock or boulder		at 21
IPSWICH 313. Alt. about 50 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, coarse, brown, with much silt, some gravel and cobbles	18	18
Sand, very fine, silt, and clay; brown; boulders and hard drilling near bottom of hole	12	30
Refusal:		
Till or bedrock		at 30
IPSWICH 332. Alt. about 10 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, fine, with silt	5	5
Silt and clay	2	7
Clay, blue; beds about 6 in. thick and 1 ft. apart	11	18
Silt or sand (reported by driller)	10	28
Clay	12	40
Till	10	50
Refusal:		
Bedrock or boulder		at 50
NEWBURY 3. Alt. 51.8 ft. Driller's log of test hole.		
Till:		
Clayey loam	2.0	2.0
Clay, hard, with sand streaks	10.6	12.6
Refusal:		
Bedrock or boulder		at 12.6
This log is representative of test holes Newbury 2-11.		
NEWBURY 27. Alt. about 55 ft.		
Driller's log of water well.		
Fill:		
Loam	2	2
Marine deposits:		
Clay, gray-green	7	9
Till:		
Gravel, hard	10.9	19.9
NEWBURY 31. Alt. about 30 ft.		
Owner's log of water well.		
Marine deposits:		
Cellar excavation	6	6
Sand	11	17
Clay	6	23
NEWBURY 32. Alt. about 45 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, fine to medium, yellow-brown; some mica; few pebbles, rounded	7	7
Silt, clayey, brown, hard; some sand	46	53
Refusal:		
Bedrock or boulder		at 53
NEWBURY 33. Alt. about 70 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, fine to coarse, silty, brown; and gravel, fine to coarse, rounded	15	15
Silt, clayey; gray-brown, sand; gravel, fine; compact	10	25
Silt, clayey, gray	56	81
Refusal:		
Bedrock or boulder		at 81
NEWBURY 36. Alt. about 45 ft.		
Geologist's log of auger hole.		
Ice-contact deposits:		
Sand, fine to medium, brown	20	20
Sand, fine to coarse, subangular, brown; little gravel	62	82
Auger hole in pit about 20 ft. below original land surface.		
NEWBURY 37. Alt. about 50 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, silty, brown, and gravel	5	5
Silt, clayey, brown	15	20
Silt, clayey, gray	33	53
Refusal:		
Bedrock or boulder		at 53
NEWBURY 38. Alt. about 45 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, fine to medium, brown	7	7
Silt, clayey, brown	13	20
Silt, clayey, gray	50	70
Refusal:		
Bedrock or boulder		at 70
NEWBURY 39. Alt. about 30 ft.		
Owner's log of water well.		
Marine deposits:		
Loam	1	1
Sand	18	19
Clay	2	21
NEWBURY 56. Alt. about 20 ft.		
Owner's log of water well.		
Marine deposits:		
Sand	5	5
Clay	55	60
Marine deposits?:		
Gravel, coarse	20	80
NEWBURY 74. Alt. about 20 ft.		
Driller's log of test well.		
Marine deposits:		
Sand and loam	3.0	3.0
Clay, blue	35.0	38.0
Sand, fine, and gravel, coarse	3.0	41.0
Till:		
Sand, hard, gravel, and some clay	4.0	45.0
This log is representative of test wells Newbury 71-82.		
NEWBURY 88. Alt. about 15 ft.		
Driller's log of test hole.		
Fill:		
Sand and gravel	4.5	4.5
Marine deposits:		
Clay, yellow, stiff; trace of sand, fine	9.5	14.0
Clay, blue, very stiff; trace of sand, fine	37.0	51.0
This log is representative of test holes Newbury 87-89.		
NEWBURY 90. Alt. about 10 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand, with some clay and gravel	28	28
Sand, gray, fine	12	40
Sand and gravel	7	47
Clay	23	70
Till?:		
Clay, sand, gravel, and cobbles; hard drilling	41	111
Refusal:		
Bedrock or boulder		at 111
NEWBURY 91. Alt. about 45 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Sand and gravel	5	5
Gravel	5	10
Clay	30	40
Till?:		
Gravel, hard drilling	5	45
Refusal:		
Bedrock or boulder		at 45
NEWBURY 92. Alt. about 15 ft.		
Geologist's log of auger hole.		
Fill	2	2
Marine deposits:		
Clay, brown	12	14
Clay, blue	4	18
Silt, fine, gray	22	40
Sand, compact	3	43
Silt, fine	8	51
Sand	7	58
Clay, brown	11	69
Refusal:		
Bedrock or boulder		at 69
NEWBURY 93. Alt. about 8 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Soil	2	2
Clay, brownish-gray	11	13
Clay, gray	65	78
Till	6	84
Refusal:		
Bedrock or boulder		at 84
NEWBURYPORT 39. Alt. 63.5 ft.		
Driller's log of test hole.		
Ice-contact deposits:		
Sand and gravel	4	4
Gravel	4½	8½
Gravel, hard	6½	15
Sand and gravel	12	27
Sand, medium to fine	8	35
This log is representative of test holes Newburyport 34-39.		
NEWBURYPORT 40. Alt. 22.3 ft.		
Driller's log of test hole.		
Artificial fill	1.5	1.5
Marine deposits:		
Clay, medium, yellowish	8.5	10.0
Clay, soft, blue	22.0	32.0
Till?:		
Sand, gravel, and clay; compact	3.4	35.4
Refusal:		
Bedrock or boulder		at 35.4
This log is representative of test holes Newburyport 40-49.		
NEWBURYPORT 53. Alt. 81.9 ft.		
Driller's log of test hole.		
Fill:		
Loamy sand	3.0	3.0
Marine deposits:		
Sand, fine, with some clay	4.5	7.5
Till?:		
Sand and clay, compact	7.5	15.0
Refusal:		
Bedrock or boulder		at 15.0
This log is representative of test holes Newburyport 50-59.		

Table 3.--Logs of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

	Thickness	Depth
NEWBURYPORT 64. Alt. 81.2 ft.		
Driller's log of test hole.		
Marine deposits:		
Loam	3.0	3.0
Sand, fine	5.0	8.0
Sand, fine, compact, with trace of clay	10.0	18.0
Sand, very fine, compact, with clay	8.3	26.3
Till?:		
Sand, very compact, and gravel, with some clay	9.2	35.5
Refusal:		
Bedrock or boulder		at 35.5
This log is representative of test holes Newburyport 60-69.		
NEWBURYPORT 71. Alt. about 30 ft.		
Geologist's log of auger hole.		
Ice-contact and marine deposits, undifferentiated:		
Sand, fine to medium, silty, brown	20	20
Sand, fine to medium, silty, gray-brown	37	57
NEWBURYPORT 76. Alt. about 5 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, soft, blue	65	65
Quicksand, blue	45	110
NEWBURYPORT 81. Alt. 6.2 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, soft, blue	36	36
Quicksand, blue	14	50
Gravel, fine, blue	1	51
Refusal:		
Bedrock		at 51
This log is representative of test wells Newburyport 75, 77-84.		
NEWBURYPORT 86. Alt. 8.5 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, soft, blue	72½	72½
Gravel, fine, blue	1½	74
Refusal:		
Bedrock		at 74
This log is representative of test wells Newburyport 86, 87, and 107.		
NEWBURYPORT 91. Alt. 14.5 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, soft, blue	15.0	15.0
Quicksand, blue	0.5	15.5
Gravel, blue	0.8	16.3
Refusal:		
Bedrock		at 16.3
This log is representative of test wells Newburyport 88-91.		
NEWBURYPORT 95. Alt. 14.4 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, blue	33	33
Gravel, blue	1	34
Refusal:		
Bedrock		at 34
This log is representative of test wells Newburyport 92-99, and 115.		
NEWBURYPORT 100. Alt. 15.6 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, blue	23	23
Gravel, blue	3	26
Refusal:		
Bedrock		at 26
This log is representative of test wells Newburyport 100-103.		
NEWBURYPORT 104. Alt. 19.1 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, yellow	14	14
Clay, blue, soft	21	35
Quicksand, blue	26	61
Gravel, fine hard	2.5	63.5
NEWBURYPORT 106. Alt. about 25 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, yellow and blue	14	14
Quicksand, blue	6	20
Quicksand, reddish	6	26
Quicksand, blue	4	30
Quicksand, reddish	5	35
Quicksand, blue	8	43
Refusal:		
Bedrock		at 43
NEWBURYPORT 109. Alt. 17.7 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, blue	26	26
Sand, blue	26	52
Gravel, very hard	1	53
Refusal:		
Bedrock		at 53
This log is representative of test wells Newburyport 108 and 109.		
NEWBURYPORT 110. Alt. about 20 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, yellow	18	18
Clay, blue	10	28
Sand, fine, blue	7	35
Refusal:		
Bedrock		at 35
NEWBURYPORT 113. Alt. 10.3 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, blue	37	37
Gravel, hard, blue	1.5	38.5
Refusal:		
Bedrock		at 38.5
This log is representative of test test wells Newburyport 113 and 138.		
NEWBURYPORT 114. Alt. about 15 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, blue	57.8	57.8
Refusal:		
Bedrock		at 57.8
NEWBURYPORT 116. Alt. about 50 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	2	2
Clay, soft, gray	8	10
Sand, fine, brown, and clay	30	40
Refusal:		
Bedrock		at 40
NEWBURYPORT 117. Alt. about 50 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	2	2
Clay, soft, brown	41	43
Clay, soft, gray	23	66
Till?:		
Sand, fine to medium, gray, gravel, and clay	6	72
Refusal		at 72
This log is representative of test wells Newburyport 117-119.		
NEWBURYPORT 132. Alt. about 45 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	2	2
Clay, soft, gray	16	18
Clay, soft, gray, and gravel; tight	19.8	37.8
Refusal		at 37.8
NEWBURYPORT 133. Alt. about 100 ft.		
Driller's log of test well.		
Ice-contact and marine deposits, undifferentiated:		
Sand, coarse, brown, and gravel; tight	16	16
Sand, coarse, brown, gravel, and clay; tight	13.5	29.5
Refusal		at 29.5
This log is representative of test wells Newburyport 133 and 134.		
NEWBURYPORT 135. Alt. about 85 ft.		
Driller's log of test well.		
Ice-contact and marine deposits, undifferentiated:		
Sand, brown, and gravel	14	14
NEWBURYPORT 135.--Continued		
Ice-contact and marine deposits, undifferentiated:--Continued		
Sand, fine to medium, brown	12	26
Sand, fine, brown; some clay; tight	15.8	41.8
Sand, fine, tan, and clay; tight	12.7	54.5
Sand, fine, tan, and clay, gray; some gravel; tight	8.0	62.5
Sand, fine, gray, and clay; tight	20.0	82.5
Refusal:		
Bedrock		at 82.5
NEWBURYPORT 136. Alt. about 25 ft.		
Driller's log of test well.		
Fill:		
Sand and gravel	4	4
Marine deposits:		
Clay, hard, brown	16	20
Clay, soft, gray	25	45
Sand, gray, and gravel; some clay	8.5	53.5
Refusal		at 53.5
This log is representative of test wells Newburyport 136 and 141.		
NEWBURYPORT 137. Alt. about 25 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	2	2
Clay, firm, gray	19	21
Clay, soft, gray	42	63
Sand, medium, gray, and gravel	1.5	64.5
Refusal		at 64.5
NEWBURYPORT 139. Alt. about 30 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	2	2
Clay, firm, gray	16	18
Clay, soft, gray	28	46
Refusal		at 46
NEWBURYPORT 140. Alt. about 20 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	2	2
Clay, hard, gray	12	14
Clay, firm, gray	14	28
Clay, soft, gray	48	76
Till?:		
Hardpan	1.7	77.7
Refusal		at 77.7
NEWBURYPORT 143. Alt. about 40 ft.		
Driller's log of test well.		
Till:		
Sand, gray, sharp gravel, and clay	15.5	15.5
Refusal		at 15.5
NEWBURYPORT 144. Alt. about 30 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, hard, brown	8	8
Clay, gray	17	25
Till?:		
Clay, gray, and sharp gravel; tight	3	28
Refusal		at 28
NEWBURYPORT 145. Alt. about 45 ft.		
Driller's log of test well.		
Marine deposits:		
Sand, fine, dark	6	6
Clay, gray	8	14
Sand, fine, brown	5	19
Till:		
Sand, fine, gray, clay, and gravel, small, dark	4	23
Refusal		at 23
NEWBURYPORT 146. Alt. about 35 ft.		
Driller's log of test well.		
Marine deposits:		
Clay, brown	14	14
Clay, gray	9	23
Till?:		
Clay, gray, and gravel, sharp	2.5	25.5
Refusal		25.5

	Thickness	Depth
NEWBURYPORT 147. Alt. about 15 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Topsoil	4	4
Clay	6	10
Sand, fine, gray	31	41
Sand, firm	43	84
Gravel	6	90
Refusal		at 90
ROWLEY 31. Alt. about 70 ft.		
Geologist's log of auger hole.		
Outwash:		
Sand, coarse, poorly sorted, silty, brown, changing to gray with depth; texture becomes finer with depth; bottom of hole appears to be in gray clayey silt	55	55
Refusal:		
Bedrock or boulder		at 55
ROWLEY 32. Alt. about 70 ft.		
Geologist's log of auger hole.		
Marine deposits and outwash, undifferentiated:		
Sand, fine, silty, brown	40	40
Ice-contact deposits?:		
Gravel, fine to coarse	7	47
Refusal:		
Bedrock or boulder		at 47
Auger hole in pit about 6 ft. below original land surface.		
ROWLEY 33. Alt. about 60 ft.		
Geologist's log of auger hole.		
Marine deposits and outwash, undifferentiated:		
Sand, silty, poorly sorted, and gravel	35	35
Refusal:		
Bedrock or boulder		at 35
ROWLEY 35. Alt. about 35 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	1	1
Sand, brown, and clay	17	18
Sand, gray, gravel, and clay	9.8	27.8
Refusal		at 27.8
This log is representative of test wells Rowley 34 and 35.		
ROWLEY 36. Alt. about 30 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	1	1
Clay, brown	10.7	11.7
Clay, gray	8.3	20
Sand, brown, and gravel	5	25
Till?:		
Gravel, broken	2.5	27.5
ROWLEY 38. Alt. about 35 ft.		
Driller's log of test well.		
Till:		
Hardpan	15	15
Refusal		at 15
This log is representative of test wells Rowley 37 and 38.		
ROWLEY 39. Alt. about 30 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	1.5	1.5
Clay, gray	13.0	14.5
Till:		
Hardpan	11.5	26.0
Refusal		at 26.0
ROWLEY 41. Alt. about 45 ft.		
Driller's log of test well.		
Till:		
Hardpan	5.1	5.1
Refusal		at 5.1
This log is representative of 2 test wells at this site.		
ROWLEY 42. Alt. about 40 ft.		
Driller's log of test well.		
Swamp deposits:		
Mud	1.0	1.0
Marine deposits:		
Clay, gray	14.0	15.0
Sand, gravel, and clay, gray	7.7	22.7
Refusal		at 22.7
ROWLEY 44. Alt. about 15 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	1	1

	Thickness	Depth
ROWLEY 44.--Continued		
Marine deposits:--Continued		
Clay, gray	25.4	26.4
Ice-contact deposits?:		
Gravel and broken stone	3.6	30.0
Till:		
Hardpan	5.0	35.0
Refusal		at 35.0
This log is representative of test wells Rowley 43 and 44.		
ROWLEY 45. Alt. about 45 ft.		
Driller's log of test well.		
Marine deposits:		
Sand, medium, brown; trace of clay	18.6	18.6
Sand, fine, brown, and gravel; drove hard at 22 feet	7.8	26.4
ROWLEY 46. Alt. about 40 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	1	1
Marine deposits:		
Sand, fine to medium, brown; some clay	13	14
Sand, medium, and gravel; some clay	7.7	21.7
ROWLEY 47. Alt. about 30 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	1.5	1.5
Marine deposits:		
Sand, medium, and gravel	14.7	16.2
Till:		
Hardpan	4.0	20.2
Refusal		at 20.2
ROWLEY 48. Alt. about 30 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	1	1
Sand, medium, brown	16.6	17.6
Refusal		at 17.6
ROWLEY 49. Alt. about 40 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	1.0	1.0
Marine deposits:		
Hardpan	1.5	2.5
Sand, brown	10.8	13.3
Till:		
Hardpan	1.2	14.5
Sand, tan to gray, and boulders	3.7	18.2
Refusal		at 18.2
ROWLEY 50. Alt. about 55 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	1	1
Outwash:		
Sand, fine to medium, brown, and gravel, fine	8	9
Sand, medium, brown, and gravel, fine	8.3	17.3
Refusal		at 17.3
This log is representative of 2 test wells at this site.		
ROWLEY 52. Alt. about 55 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	2.3	2.3
Outwash:		
Sand, fine to medium, brown, and gravel	13.7	16.0
Sand, fine to medium, brown, and gravel, coarse	9.0	25.0
Till?:		
Drove hard	0.9	25.9
Refusal		at 25.9
This log is representative of test wells Rowley 52 and 58.		
ROWLEY 56. Alt. about 60 ft.		
Driller's log of test well.		
Ice-contact deposits:		
Loam	0.5	0.5
Sand, brown, gravel, and boulders	19.5	20
Refusal		at 20

	Thickness	Depth
ROWLEY 59. Alt. about 85 ft.		
Driller's log of test well.		
Ice-contact deposits?:		
Topsoil	2	2
Hardpan	19.9	21.9
Refusal		at 21.9
This log is representative of test wells Rowley 59-61.		
ROWLEY 62. Alt. about 65 ft.		
Driller's log of test well.		
Outwash:		
Topsoil	1.2	1.2
Sand, fine to medium, brown, and gravel	12.7	13.9
Sand, fine to medium, tan, and gravel; trace of gray sand and clay	5.4	19.3
Sand, fine to medium, tan and gray	10.2	29.5
Refusal		at 31.2
ROWLEY 64. Alt. about 70 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	1	1
Ice-contact deposits:		
Sand, fine to medium, brown, and gravel	13	14
Sand, fine to medium, tan and brown; gravel	5.4	19.4
Refusal		at 19.4
This log is representative of test wells Rowley 63 and 64.		
ROWLEY 65. Alt. about 55 ft.		
Driller's log of test well.		
Marine deposits:		
Loam	1.4	1.4
Sand, tan, and clay, gray	9.8	11.2
Clay, gray, and sand, gray	13.3	24.5
Sand, coarse, brown; some gravel; trace of gray clay	1.9	26.4
Ice-contact deposits:		
Sand, coarse, brown, and gravel	31.9	58.3
Refusal		at 58.3
This log is representative of test wells Rowley 65-67.		
ROWLEY 70. Alt. about 5 ft.		
Owner's log of water well.		
Marine deposits:		
Topsoil	1.5	1.5
Clay, light	3.5	5
Clay, gray-blue	7.7	12.7
ROWLEY 81. Alt. about 20 ft.		
Driller's log of test well.		
Swamp deposits:		
Peat	5	5
Marine deposits:		
Sand and clay	9	14
Gravel and clay	10	24
ROWLEY 82. Alt. about 60 ft.		
Driller's log of test well.		
Marine deposits:		
Sand and clay	18	18
Gravel and clay	9	27
Till:		
Hardpan	4	31
This log is representative of 9 test wells at this site.		
ROWLEY 84. Alt. about 30 ft.		
Driller's log of test well.		
Marine deposits:		
Topsoil	6	6
Sand, fine, and clay	35	41
Gravel and clay	13	54
ROWLEY 85. Alt. about 55 ft.		
Driller's log of test well.		
Marine deposits:		
Gravel	15	15
Sand, fine, and clay	12	27
Ice-contact deposits?:		
Gravel	8	35
This log is representative of 4 test wells at this site.		

Table 3.--Logs of selected wells, test wells, and test holes in the Parker and Rowley River basins, Massachusetts--Continued

	Thickness	Depth
ROWLEY 87. Alt. about 50 ft.		
Driller's log of test well.		
Marine deposits:		
Topsoil, and sand	15.3	15.3
Clay	53.0	68.3
Clay, and sand; some gravel	10.5	78.8
ROWLEY 98. Alt. about 5 ft.		
Driller's log of test hole.		
Salt-water marsh deposits:		
Silty peat	10.0	10.0
Silty peat, very soft	15.0	25.0
Marine deposits:		
Sand, very fine to fine, blue, and little clay	7.0	32.0
Clay, blue, very soft	18.0	50.0
Clay, medium; sand, fine; gravel, fine	11.0	61.0
ROWLEY 99. Alt. about 5 ft.		
Driller's log of test hole.		
Salt-water marsh deposits:		
Peat	6.0	6.0
Marine deposits:		
Clay, blue, soft, and very fine sand	9.0	15.0
Sand, fine, yellow, loose	10.0	25.0
Clay, blue, soft, and little fine sand	3.0	28.0
Sand, very fine, and clay	4.0	32.0
ROWLEY 100. Alt. about 15 ft.		
Driller's log of test hole.		
Marine deposits:		
Loamy sand	3.0	3.0
Clay, and little fine sand	16.0	19.0
Sand, fine, very compact, and little yellow clay	5.0	24.0
Sand, fine, loose, and blue clay	5.0	29.0
Sand, fine, hard, little blue clay	2.0	31.0
ROWLEY 101. Alt. about 5 ft.		
Driller's log of test hole.		
Salt-water marsh and marine deposits, undifferentiated:		
Peat	9.0	9.0
Organic silty sand and little clay	21.0	30.0
Peat	4.0	34.0
Marine deposits:		
Sand, very fine, hard, and trace of clay	1.5	35.5
ROWLEY 102. Alt. about 10 ft.		
Driller's log of test hole.		
Marine deposits:		
Clay, medium to stiff, and fine sand	9.5	9.5
Clay, stiff, and fine sand	8.5	18.0
Sand, fine, and trace of clay	3.5	21.5
Sand, fine, loose, and trace of blue clay	8.5	30.0
WEST NEWBURY 17. Alt. about 90 ft.		
Geologist's log of auger hole.		
Marine deposits and outwash, undifferentiated:		
Soil	3	3
Sand, brown	6	9
Clay	3	12
Till:		
Gravel and clay	2.8	14.8
Refusal:		
Bedrock or boulder		at 14.8
This log is representative of 2 auger holes at this site.		
WEST NEWBURY 19. Alt. about 70 ft.		
Geologist's log of auger hole.		
Marine deposits:		
Soil	1	1
Clay	9	10
Sand, fine, and silt	0½	10½
Till:		
Clay and gravel, gray	10½	21
Refusal		at 21
This log is representative of 2 auger holes at this site.		

Table 4.--Chemical analyses of water from selected wells in the Parker and Rowley River basins, Massachusetts

(Analytical results in parts per million except as indicated)

(Analyses by U. S. Geological Survey)

Well no.	Date of collection (1960)	Temperature (°F)	Silica (SiO_2)	Total iron (Fe)	Total manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (Residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate			
WELLS FINISHED IN STRATIFIED DRIFT 1/																				
Boxford 193	4/25	49	9.8	0.02	0.01	16	2.4	5.8	2.4	21	17	7.0	0.1	23	99	50	33	151	5.6	4
Georgetown 36	9/14	55	7.7	.26	.20	12	1.8	7.0	2.2	11	29	11	.2	1.9	80	38	29	128	6.0	4
45	8/15	55	8.1	.07	.14	21	2.6	4.9	.5	58	14	6.0	.1	3.7	90	63	16	147	6.9	3
51	9/8	59	9.2	.12	.07	24	6.9	8.3	4.7	25	20	13	.1	67	170	89	68	258	6.2	3
Rowley 68	4/25	50	5.3	.08	.10	13	1.6	2.6	1.8	18	14	5.0	.0	13	75	39	24	101	6.8	2
71	9/21	60	13	.66	.0	9.2	2.8	5.8	2.1	30	12	7.0	.0	.5	71	35	10	108	6.4	2
WELLS FINISHED IN MARINE DEPOSITS																				
Newbury 39	4/25	51	8.9	.08	.0	16	2.8	8.6	3.8	31	15	21	.0	2.2	100	52	26	167	6.0	1
59	4/25	47	13	.03	.01	19	3.9	9.9	10.0	38	28	10	.1	30	150	64	33	213	6.0	11
67	9/8	60	10	.18	.18	21	4.5	16	4.1	30	27	23	.1	31	162	71	47	249	6.1	2
68	8/9	57.5	14	2.0	1.1	22	3.4	5.9	.6	72	17	6.0	.2	.7	109	69	10	173	6.4	5
Newburyport 70	9/21	61.5	10	.34	.1	44	5.6	16	2.5	128	47	14	.1	.2	200	133	28	331	7.1	3
73	9/21	50	15	.20	.1	38	8.2	19	3.2	121	48	17	.1	.2	210	129	30	343	7.2	3

1/Includes ice-contact deposits and outwash.

Table 4.--Chemical analyses of water from selected wells in the Parker and Rowley River basins, Massachusetts--Continued

Well no.	Date of collection (1960)	Temperature (°F)	Silica (SiO_2)	Total iron (Fe)	Total manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (Residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate			
WELLS FINISHED IN TILL																				
Newbury 27	9/16	54	14	0.17	0.0	19	5.8	12	2.2	37	16	33	0.1	4.1	133	72	41	213	5.8	2
West Newbury 1	9/15	49	10	.05	.00	41	6.5	12	5.1	102	30	12	.1	37	210	129	46	325	7.1	3
WELLS FINISHED IN BEDROCK																				
Boxford 256	5/4	50	18	.43	.07	17	4.8	8.0	1.8	79	11	4.8	.2	.1	104	62	0	164	7.1	4
Georgetown 44	5/4	50	15	.17	.03	22	9.0	14	1.5	92	29	12	.2	.3	149	92	17	247	7.4	3
Newbury 40	4/25	50	9.7	.04	.01	26	22	5.5	1.6	164	22	7.5	.1	2.3	177	156	21	320	7.5	2
41	4/25	52	13	.08	.06	13	4.4	59	2.2	151	12	32	.1	.2	211	51	0	361	7.6	3
70	10/5	52	9.1	.15	.0	48	5.8	38	1.4	97	24	85	.0	6.7	286	144	15	488	7.4	3

Table 5.--Chemical analyses of pore water, from clay of the marine deposits, Parker and Rowley River basins, Massachusetts

(Analytical results in parts per million except as indicated)

(Analyses by U. S. Geological Survey)

Sample number	Date of collection	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH
											Calcium, magnesium	Noncarbonate		
60 MAS 16 1/	4-12-60	57	119	1420	36	-	720	1790	1.0	2.1	-	-	7200	-
60 MAS 18 2/	4-12-60	28	14	45	3.8	-	35	26	0.8	3.5	-	-	451	-
60 MAS 19 3/	4-12-60	20	20	115	4.4	-	64	73	0.6	0.8	-	-	750	-
60 MAS 40	10- 6-60	29	17	263	10	398	56	243	1.7	0.3	143	0	1470	8.2
60 MAS 46	10- 6-60	59	21	41	5.4	113	-	38	0.6	-	234	141	648	7.8

1/ Corresponds to sample no. 1, Table 10.

2/ Corresponds to sample no. 3, Table 10.

3/ Corresponds to sample no. 4, Table 10.

Table 6.--Water levels in observation wells in the Parker and Rowley River basins, Massachusetts

(Water levels in feet below land-surface datum. For description of wells, see table 2.)

BOXFORD 194

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	13.84	Oct. 21	15.22	Apr. 7	10.30
29	13.30	Nov. 5	15.03	May 4	10.90
Aug. 5	13.31	18	14.63	June 2	11.93
12	13.66	Dec. 3	13.75	July 1	13.23
18	14.08	17	12.10	Aug. 1	14.44
26	14.45	1960		30	15.12
Sept. 2	14.72	Jan. 14	11.38	Sept. 28	14.15
9	14.90	Feb. 11	12.37	1961	
16	15.09	Mar. 10	11.10	Mar. 28	10.25
Oct. 8	15.56				

GEORGETOWN 30

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	6.33	Oct. 21	9.04	Apr. 7	3.97
29	7.48	Nov. 5	8.32	May 4	7.80
Aug. 5	9.01	18	7.44	June 2	8.37
12	9.43	Dec. 3	6.22	July 1	10.18
18	10.08	17	5.28	Aug. 1	10.53
26	10.41	1960		30	11.11
Sept. 2	10.37	Jan. 14	7.09	Sept. 28	8.32
9	10.20	Feb. 11	5.48	1961	
16	10.53	Mar. 10	7.15	Mar. 28	4.90
Oct. 8	10.46				

GEORGETOWN 31

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	2.60	Oct. 21	4.42	Apr. 7	2.43
29	3.88	Nov. 5	3.36	May 4	3.18
Aug. 5	4.74	18	2.18	June 2	3.25
12	4.39	Dec. 3	2.38	July 1	5.71
18	5.02	17	2.57	Aug. 1	5.37
26	5.55	1960		30	7.34
Sept. 2	4.95	Jan. 14	3.54	Sept. 28	4.32
9	4.88	Feb. 11	0.81	1961	
16	4.52	Mar. 10	3.23	Mar. 28	2.06
Oct. 8	3.30				

GEORGETOWN 33
(Daily high water levels from recorder graph)

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 17	20.10	Nov. 25	e/19.8	Mar. 31	18.85
20	20.09	30	e/19.5	Apr. 5	18.17
25	e/19.6	Dec. 5	e/19.0	10	e/17.4
31	18.81	10	e/18.4	15	e/17.2
Aug. 5	18.68	15	e/17.5	20	e/17.5
10	18.95	20	e/17.3	25	17.77
15	19.24	25	e/17.4	30	18.14
20	19.55	31	e/17.5	May 5	18.47
25	19.89	1960		10	18.69
31	20.27	Jan. 5	e/17.6	15	18.86
Sept. 5	20.45	10	e/17.7	20	19.02
10	20.57	15	17.86	25	19.16
15	20.72	20	18.13	31	19.22
20	20.84	25	18.52	June 5	19.17
25	20.93	31	18.88	10	19.20
30	21.07	Feb. 5	19.12	15	19.28
Oct. 5	21.18	10	19.02	20	19.40
10	21.20	15	17.92	25	19.57
15	21.12	20	17.34	30	19.78
20	e/21.0	25	17.20	July 5	19.98
25	e/20.9	29	17.37	10	20.18
31	e/20.7	Mar. 5	17.57	15	20.42
Nov. 5	e/20.6	10	17.92	20	20.61
10	e/20.4	15	18.25	25	20.78
15	e/20.2	20	18.55	31	21.02
20	e/20.0	25	18.79	Aug. 5	21.13

GEORGETOWN 33--Continued

Date	Water level	Date	Water level	Date	Water level
1960		1960		1960	
Aug. 10	21.33	Aug. 31	21.85	Sept. 20	21.97
15	21.47	Sept. 5	21.99	25	21.75
20	21.59	10	22.12	30	21.58
25	21.68	15	22.16	Oct. 5	e/21.45

e/ estimated

GEORGETOWN 35

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	20.56	Oct. 8	21.26	Mar. 10	18.80
29	22.74	21	21.25	Apr. 7	18.53
Aug. 5	20.34	Nov. 5	21.22	May 4	18.62
12	20.42	18	21.15	June 2	19.08
18	20.56	Dec. 3	20.59	July 1	19.62
26	20.70	17	20.42	Aug. 1	20.38
Sept. 2	20.82	1960		30	20.97
9	20.88	Jan. 14	19.79	Sept. 28	21.27
16	20.98	Feb. 11	19.80		

GEORGETOWN 36
(Daily high water levels from recorder graph)

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 25	10.80	Dec. 25	10.24	May 15	10.57
31	11.07	31	10.38	20	10.71
Aug. 5	11.26	1960		25	10.64
10	11.29	Jan. 5	10.12	31	10.81
15	e/11.4	10	10.27	June 5	10.82
20	e/11.6	15	10.39	10	10.97
31	e/11.6	20	10.52	15	11.12
Sept. 5	e/11.6	25	10.67	20	11.26
10	e/11.7	31	10.71	25	11.42
15	e/11.7	Feb. 5	10.83	30	11.61
20	11.73	10	10.41	July 5	11.67
25	11.87	15	9.91	10	11.83
30	11.98	20	9.48	15	11.82
Oct. 5	11.98	25	9.56	20	11.91
10	11.44	29	9.37	25	12.04
15	11.43	Mar. 5	9.63	31	12.03
20	11.55	10	9.92	Aug. 5	12.15
25	11.48	15	10.12	10	12.23
31	11.44	20	10.12	15	12.27
Nov. 5	11.45	25	10.23	20	12.23
10	11.31	31	9.78	25	12.33
15	11.27	Apr. 5	9.37	31	12.53
20	11.20	10	9.22	Sept. 5	12.57
25	11.12	15	9.38	10	12.73
30	10.88	20	9.67	15	11.88
Dec. 5	10.82	25	9.91	20	11.82
10	10.57	30	10.09	25	11.74
15	10.12	May 5	10.30	30	11.73
20	10.12	10	10.45	Oct. 5	11.78

e/ estimated

NEWBURY 24

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	12.6	Oct. 21	15.14	May 5	10.80
29	12.4	Nov. 5	14.65	June 2	10.94
Aug. 5	12.8	18	13.56	July 1	13.57
12	13.2	Dec. 3	12.00	Aug. 1	15.35
18	14.0	17	10.34	30	16.05
26	14.6	1960		Sept. 28	16.01
Sept. 2	15.0	Jan. 14	11.14	1961	
9	15.1	Feb. 11	10.65	Mar. 28	10.00
16	15.2	Mar. 10	10.70		
Oct. 8	15.46	Apr. 7	8.81		

Table 6.--Water levels in observation wells in the Parker and Rowley River basins, Massachusetts--Continued

NEWBURY 25

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	9.28	Oct. 8	12.00	May 5	10.24
29	9.55	21	12.07	June 2	10.14
Aug. 5	10.34	Nov. 5	11.65	July 1	10.88
12	10.50	18	10.94	Aug. 1	11.90
18	10.77	Dec. 3	10.35	30	13.20
26	10.96	17	9.68	Sept. 28	13.27
Sept. 2	11.08	1960		1961	
9	11.34	Jan. 14	10.32	Mar. 28	9.76
16	11.50	Apr. 7	9.24		

NEWBURY 26

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	1.42	Oct. 8	1.53	Apr. 7	1.03
29	2.04	21	2.18	May 5	1.44
Aug. 5	2.33	Nov. 5	1.89	July 1	2.45
12	2.25	18	1.29	Aug. 1	2.35
18	2.30	Dec. 3	1.40	30	2.81
26	2.15	17	1.32	Sept. 28	2.44
Sept. 2	2.15	1960		1961	
9	2.34	Jan. 14	1.54	Mar. 28	1.30
16	1.85	Feb. 11	0.21		

NEWBURY 27

(Daily high water levels from recorder graph)

Date	Water level	Date	Water level	Date	Water level
1959		1960		1960	
July 21	7.91	Jan. 15	6.72	June 5	6.76
25	7.05	20	7.03	10	7.10
29	7.48	24	7.39	15	7.50
Aug. 5	e/8.18	Feb. 11	5.37	20	7.97
10	8.59	15	5.84	25	8.38
15	8.99	20	5.42	30	8.86
20	9.37	25	5.83	July 5	9.13
25	9.66	29	5.69	10	9.49
31	9.96	Mar. 5	5.89	15	9.77
Sept. 5	9.97	10	6.14	20	9.97
10	10.16	15	6.42	25	10.19
15	10.39	20	6.24	31	10.45
20	10.45	25	6.28	Aug. 5	10.58
25	10.63	31	5.49	10	10.83
30	10.87	Apr. 5	5.35	15	10.98
Oct. 5	11.00	10	5.38	20	11.13
10	10.66	15	5.56	25	11.29
15	10.43	20	5.80	31	11.54
20	10.43	25	5.98	Sept. 5	11.75
25	10.42	30	6.07	10	11.95
31	10.24	May 5	6.22	15	11.75
Nov. 5	10.10	10	6.37	21	11.65
5	7.66	15	6.43	25	11.35
10	7.08	20	6.57	30	11.28
15	6.02	25	6.55	Oct. 5	11.34
20	6.18	31	6.52		
25	6.48				

e/ estimated

NEWBURYPORT 70

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	0.19	Oct. 21	1.92	Apr. 7	0.27
29	1.12	Nov. 5	0.55	May 5	0.34
Aug. 5	1.63	18	0.44	June 2	0.35
12	2.31	Dec. 3	0.81	July 1	2.85
18	2.73	17	0.81	Aug. 1	3.83
26	2.89	1960		30	4.90
Sept. 2	2.67	Jan. 14	0.49	Sept. 28	3.49
9	2.84	Feb. 11	+0.09	1961	
16	2.12	Mar. 10	0.32	Mar. 28	0.21
Oct. 8	1.97				

\+ Water level above land-surface datum.

ROWLEY 27

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	11.33	Oct. 21	12.16	Apr. 7	9.15
29	11.36	Nov. 5	13.08	May 5	10.35
Aug. 5	11.81	18	12.92	June 2	10.82
12	12.10	Dec. 3	12.10	July 1	12.20
18	12.40	17	11.17	Aug. 1	12.98
26	12.62	1960		30	13.76
Sept. 2	12.62	Jan. 14	11.28	Sept. 28	13.85
9	12.84	Feb. 11	10.84	1961	
16	12.87	Mar. 10	10.34	Mar. 28	10.65
Oct. 8	13.13				

ROWLEY 28

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	7.17	Oct. 21	8.30	Apr. 7	6.06
29	7.52	Nov. 5	8.20	May 5	7.34
Aug. 5	7.86	18	7.99	June 2	7.64
12	7.99	Dec. 3	7.55	July 1	8.29
18	8.13	17	7.08	Aug. 1	8.33
26	8.30	1960		30	8.74
Sept. 2	8.29	Jan. 14	7.50	Sept. 28	8.32
9	8.38	Feb. 11	6.98	1961	
16	8.32	Mar. 10	7.13	Mar. 28	6.48
Oct. 8	8.22				

WEST NEWBURY 1

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	19.63	Oct. 21	22.74	Apr. 7	15.86
29	19.69	Nov. 5	22.17	May 5	17.65
Aug. 5	20.40	18	21.34	June 2	18.74
12	20.90	Dec. 3	19.96	July 1	21.52
18	21.45	17	18.35	Aug. 1	23.71
26	22.04	1960		30	24.74
Sept. 2	22.28	Jan. 14	18.40	Sept. 28	23.53
9	22.13	Feb. 11	17.96	1961	
16	22.56	Mar. 10	17.00	Mar. 28	16.98
Oct. 8	23.40				

WEST NEWBURY 2

Date	Water level	Date	Water level	Date	Water level
1959		1959		1960	
July 23	1.80	Oct. 21	3.41	Apr. 7	1.60
29	2.96	Nov. 5	2.95	May 5	2.56
Aug. 5	3.51	18	2.27	June 2	2.55
12	3.30	Dec. 3	2.01	July 1	3.92
18	3.58	17	1.93	Aug. 1	4.10
26	3.58	1960		30	5.03
Sept. 2	2.99	Jan. 14	1/ --	Sept. 28	3.40
9	3.40	Feb. 11	0.97	1961	
16	2.78	Mar. 10	2.32	Mar. 28	1/ --
Oct. 8	2.72				

1/ Well frozen

Table 7.--Pumpage of ground water for municipal supply in the Parker and Rowley River basins, Massachusetts
(In gallons)

Calendar year	Georgetown		Ipswich		Rowley		Byfield Water District (Town of Newbury)	
	Total pumpage [1]	Daily average	Total pumpage [1]	Daily average	Total pumpage [1]	Daily average [1]	Total pumpage	Daily average
1960	76,295,810	208,500	96,373,890	[2] -	30,215,898	82,557	11,958,290	32,670
1959	72,225,290	197,900	124,559,500	-	42,253,525	115,763	8,642,740	23,680
1958	61,147,000	167,500	108,619,500	-	32,403,265	88,776	11,340,480	31,070
1957	61,688,500	169,000	169,608,800	-	-	-	5,826,920	15,960
1956	56,571,300	154,600			-	-	16,643,460	45,470
1955	49,428,300	135,400			26,881,285	73,647	14,285,310	39,140
1954	45,997,800	126,000			21,834,515	59,821	5,225,860	14,320
1953	37,746,600	103,400			-	-	7,133,040	19,540
1952	31,600,000	86,300			-	-	7,521,680	20,550
1951	33,587,000	92,000			-	-	4,090,030	11,210
1950	28,489,150	78,000			11,116,375	30,456		
1949	26,506,000	72,600						
1948	24,750,000	67,600						
1947	23,874,000	65,400						
1946	20,584,500	56,400						
1945	17,092,800	46,800						
1944	15,724,800	43,000						
1943	13,450,350	36,900						
1942	13,562,900	37,200						
1941	18,203,450	49,900						
1940	13,939,268	38,100						
1939	10,247,350	28,100						
1938	9,975,250	27,300						
1937	-	-						
1936	-	26,000						
1935	-	22,000						

[1] Record incomplete.
[2] Pumped during only part of each year; period of pumping unknown.

Table 8.--Particle-size distribution in samples of unconsolidated deposits from the Parker and Rowley River basins, Massachusetts

(In percent)

Field no.	Geologic unit	CLAY SIZES mm	SILT SIZES mm	SAND SIZES mm					GRAVEL SIZES mm			
				Very fine	Fine	Medium	Coarse	Very coarse	Very fine	Fine	Medium	Coarse
		<.004	.004-.0625	.0625-.125	.125-.25	.25-.5	.5-1.0	1.0-2.0	2-4	4-8	8-16	16-32
1	Marine deposits	47.3	51.3	0.8	0.2	0.2	0.2	0.0	-	-	-	-
2	do.	56.0	42.8	0.8	0.4	-	-	-	-	-	-	-
3	do.	63.4	36.2	0.2	0.2	-	-	-	-	-	-	-
4	do.	67.0	30.6	1.8	0.2	0.2	0.2	-	-	-	-	-
17	do.	3.2		17.8	64.8	13.4	0.6	0.2	-	-	-	-
19	do.	10.2		24.5	45.7	16.7	1.6	1.0	0.3	-	-	-
24	do.	37.0	27.3est	-	-	-	-	-	-	-	-	-
30	do.	35.2	57.8est	-	-	-	-	-	-	-	-	-
35	Outwash	2.0	7.4	6.0	19.0	27.2	20.7	9.6	4.5	1.4	1.3	0.9
5	Ice-contact deposits	2.0		1.0	3.1	7.3	10.6	13.5	21.1	20.7	15.4	5.3
6	do.	4.1		5.9	7.7	9.3	8.3	6.4	14.8	21.1	14.8	7.6
7	do.	1.2		1.9	8.6	24.3	19.0	9.1	11.3	9.2	8.6	6.8
8	do.	0.9		1.2	0.9	13.6	88.0	17.0	4.3	4.1	12.0	8.0
9	do.	0.4		0.3	1.0	6.8	31.9	33.0	14.2	6.5	5.9	-
10	do.	0.6		1.9	4.0	26.1	24.8	14.3	9.3	7.1	11.9	-
11	do.	1.5		1.2	3.4	7.0	13.3	14.2	20.4	16.2	17.8	-
12	do.	0.4		1.5	1.0	22.0	27.0	10.3	5.4	5.8	10.9	15.7
13	do.	1.9		2.2	6.5	18.1	23.1	14.3	11.9	14.9	7.1	-
14	do.	1.0		2.5	1.7	5.7	18.9	24.4	14.5	13.3	8.6	9.4
15	do.	1.0		0.9	2.6	8.7	12.3	12.4	19.9	21.4	20.8	-
16	do.	1.3		1.6	1.5	8.4	33.4	35.7	12.6	5.1	0.4	-
21	do.	1.5	78.7	18.2	1.4	0.2	-	-	-	-	-	-
25	do.	1.4	51.8	28.8	15.2	2.6	0.2	-	-	-	-	-
34	do.	2.0	8.2	10.4	20.1	19.5	12.6	9.6	5.1	2.8	4.0	5.7
28	Till	6.0	28.6	14.0	13.8	7.7	9.9	5.3	3.7	4.8	6.2	-
29	do.	17.0	32.1	10.4	10.4	10.1	7.4	3.1	4.0	5.0	0.5	-
31	do.	20.0	33.5	10.1	9.7	7.2	4.6	3.2	3.4	3.6	4.7	-
32	do.	6.6	19.6	10.9	12.2	10.5	8.9	5.7	5.4	5.6	6.7	7.9
33	do.	18.4	51.5	10.8	7.9	4.6	2.1	1.2	1.8	1.3	0.4	-
37	do.	19.4	47.1	8.3	6.6	5.7	3.0	1.8	1.3	1.4	0.6	4.8
38	do.	3.8	15.5	8.5	11.6	13.7	8.5	5.9	4.8	6.6	8.1	13.0

Table 9.--Hydrologic properties of samples of unconsolidated deposits from the Parker and Rowley River basins, Massachusetts

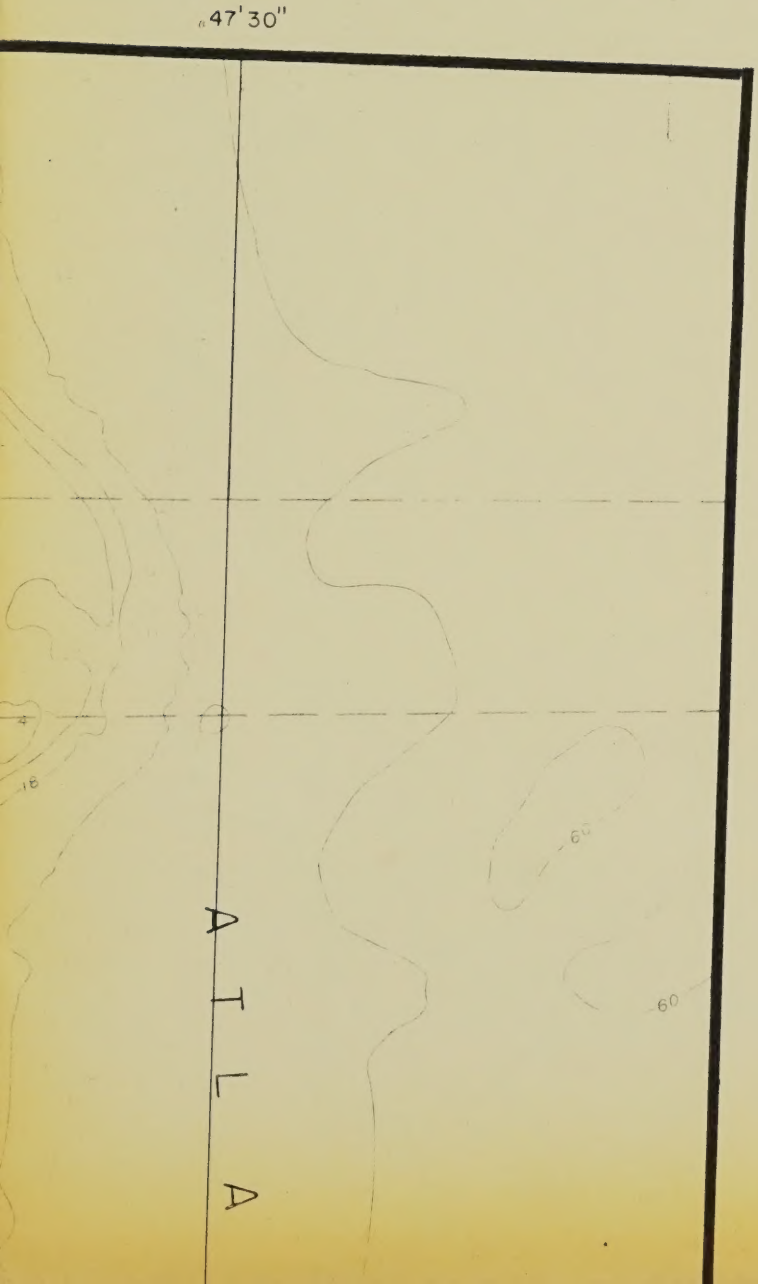
Field number	Geologic unit	Material	Depth (feet)	Specific gravity	Dry unit weight (g per cc)	Specific retention (percent)	Porosity (percent)	Specific yield (percent)	Coefficient of permeability (gpd per sq ft)	Orientation of undisturbed samples
5	Ice-contact deposits	Sand and gravel	-	2.74	1.75	13.6	36.1	22.5	180	-
6	do.	do.	-	2.75	2.04	12.6	25.8	13.2	31	-
7	do.	do.	-	2.70	1.81	6.1	33.0	26.9	520	-
8	do.	do.	-	2.69	1.75	4.7	34.9	30.2	1,000	-
9	do.	do.	-	2.69	1.75	4.1	34.9	30.8	3,100	-
10	do.	do.	-	2.69	1.81	5.1	32.7	27.6	790	-
11	do.	do.	-	2.73	1.83	6.1	33.0	26.9	3,000	-
12	do.	do.	-	2.68	1.84	3.3	31.3	28.0	1,200	-
13	do.	do.	-	2.69	1.89	4.8	29.7	24.9	580	-
14	do.	do.	-	2.69	1.83	4.1	32.0	27.9	2,100	-
15	do.	do.	-	2.71	1.85	5.9	31.7	25.8	600	-
16	do.	do.	-	2.70	1.69	5.6	37.4	31.8	2,700	-
22	do.	Silt and sand	10	2.71	1.40	10.5	48.3	37.8	7	Vertical
23	do.	do.	10	2.70	1.40	9.0	48.1	39.1	20	Horizontal
26	do.	do.	10	2.70	1.49	6.2	44.8	38.6	30	Vertical
27	do.	do.	10	2.68	1.45	7.4	45.9	38.5	23	Do.
34	do.	Silt, sand, and gravel	5-8	2.67	1.83	8.2	31.5	23.3	30	-
35	Outwash?	do.	6-13	2.67	1.79	11.8	33.0	21.2	20	-
36	Till	Clay, silt, sand, and gravel	6	2.74	1.75	30.0	36.1	6.1	0.02	Vertical
18	Marine deposits	Sand	4	2.67	1.45	2.6	45.7	43.1	230	Do.
20	do.	Silt and sand	4	2.69	1.54	4.2	42.8	38.6	170	Do.

Table 10.--Engineering properties of samples of silty clay from marine deposits of the Parker and Rowley River basins, Massachusetts

Field number	Depth (feet)	Moisture content by weight (percent)	Specific gravity	Liquid limit	Plastic limit	Plasticity index
1	2 - 3	28.8	2.75	32.2	19.2	13.0
2	7 - 8	-	2.73	-	-	-
3	2 - 3½	28.0	2.78	36.4	23.5	12.9
4	5 - 12	35.1	2.75	41.0	23.2	17.8

GSA, Boston, Mass. 62-1942

FIGURE 1



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U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

FIGURE 1

EXPLANATION

Water well or test well completed in unconsolidated deposits

Water well or test well completed in bedrock

Test hole completed in unconsolidated deposits

Observation well

Figure is serial number assigned to each well, or test hole. A separate series is used for each city or town

Recording stream gage

Boundary of Parker and Rowley River drainage basins

Datum is mean sea level

Base from U.S. Geological Survey, Special Maps Branch.

MAP OF PARKER AND ROWLEY RIVER DRAINAGE BASINS, MASSACHUSETTS, SHOWING LOCATIONS OF SELECTED WELLS AND TEST HOLES

Scale 1:24,000